

# **POST-REMEDIAL MONITORING REPORT**

**OCTOBER 2009 EVENT**

**ARMY CREEK LANDFILL**

Prepared for:

**Army Creek Landfill Remedial Trust**

Prepared by:

**Ruth Associates, Inc.**

8 East High Point Road  
Stuart, Florida 34996  
(772) 283-0959

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# RUTH ASSOCIATES, INC.

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## **1.0 Background**

The United States Environmental Protection Agency (EPA) approved permanent suspension of the pump-and-treat operation and termination of Statement-of-Work 2 for the Army Creek Landfill (ACL), with issuance of a letter in May 4, 2009. As a condition of this termination, a semi-annual post-remedial monitoring program is being implemented. Decommissioning of the pump-and-treat system will also be performed, along with abandonment of the recovery and monitoring wells no longer necessary. The May 4, 2009 EPA letter approving completion of Statement-of-Work 2 is provided in Appendix A.

The post-remedial monitoring program is outlined in the Revised Addendum to the 1992 Operation and Maintenance (O&M) Plan, prepared by Ruth Associates, Inc. (RAI) and dated October 8, 2009 (provided as Appendix B). EPA formally approved the Revised Addendum to the 1992 O&M Plan, by issuing a letter dated October 28, 2009 (provided in Appendix A).

This post-remedial monitoring program includes measurements of water levels plus monitoring of surface-water and groundwater quality. The first of these events was conducted in October of 2009. The purpose of this report is to document the activities and results of the post-remedial monitoring program. A spatial depiction of historical groundwater monitoring results, plus the inferred direction of groundwater flow, is also shown on maps.

## **2.0 Project Team**

RAI performed water-level measurements, sample collection and field parameter measurements on behalf of the County, and conducted the operation and maintenance activities for the new pumping well, PW-1. All laboratory analyses for the October 2009 Event were performed by Compu-Chem of North Carolina, except for the volatile organic analyses performed by STL Laboratory in Pittsburgh, Pennsylvania. Data validation services were provided by LAB Validation Corp. RAI compiled all water-level measurements and chemical-quality data and prepared this report.

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Corp. RAI compiled all water-level measurements and chemical-quality data and prepared this report.

## **3.0 Water-Level Monitoring**

Water levels were measured in monitoring wells within the vicinity of the DS&G and Army Creek Sites and at surface-water monitoring stations along Army Creek and Army Pond. The locations of these monitoring points are shown on Figure 1.

Upon arrival at each well and prior to measuring the groundwater elevation, the sampling personnel verified the well identification number and recorded it on the field form. Prior to opening the well, the sampling personnel inspected for and documented any signs of tampering or well deterioration. The depth to groundwater measurement was taken using a decontaminated electronic water-level indicator. Personnel slightly raised and lowered the probe at the water level a few times to determine the accurate point of contact. The static depth to water measurement was read directly off the markings on the tape to the nearest 0.01 foot from the surveyed reference mark, and was recorded along with the time and day of the measurement.

Surface-water elevations were measured synchronously with groundwater elevations. Staff gauges were used to measure the surface-water elevation at each of the monitoring locations. The depth to surface water was measured from the surveyed mark on each staff gauge, and recorded on the field form.

The groundwater and surface-water elevations calculated using the depth-to-water measurements and the surveyed elevations of the measuring points. The calculated elevations are summarized in Table 1. A map depicting the inferred direction of groundwater flow in the Upper Upper Potomac is shown in Figure 2. Groundwater and surface-water fluctuations over time are shown on Figures 3 and 4.

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## 4.0 Groundwater Monitoring

Groundwater samples were collected from thirteen wells: twelve monitoring well, four of which were formerly pumping wells; and one currently pumped well, PW-1, located immediately downgradient of Delaware Sand & Gravel's Drum Disposal Area (DS&G DDA). The October 2009 Monitoring Event was an annual event. The samples were collected and analyzed for a variety of parameters in accordance with the EPA-approved plan (provided in Appendix B), and included volatile organic compounds (VOCs), semi-volatile organic compounds (SVOCs), dissolved iron, dissolved manganese, and field indicator parameters. Samples from three of the wells were also monitored for dissolved lead.

Groundwater sampling was performed using low-flow (minimal drawdown) methods, in accordance with the EPA-approved plan. The wells were purged and sampled using either a peristaltic pump or decontaminated submersible pump. Typically, wells with a depth to water (DTW) of less than 25 feet below the top of well casing (TOC) and/or well smaller than 2" diameter were sampled with a peristaltic pump. Wells with a DTW of approximately 25 feet or more below TOC were sampled with a dedicated submersible pump. In either instance, dedicated or new high-density polyethylene (HDPE) tubing was used in each well. If a peristaltic pump was used, a dedicated or new HDPE barb fitting and silicon tubing is also used.

During well purging, the DTW, pump flow rate and field parameter was measured at intervals of three minutes or more. The pump flow rate was adjusted to limit drawdown. The first field parameter measurements were not collected until at least one volume of the pump, tubing and flow-through cell was evacuated. Field parameters included pH, conductivity, dissolved oxygen, temperature and oxygen reduction potential. Purging was considered complete when three consecutive readings met all of the following stabilization criteria:

pH	+/- 0.1 SU
Conductivity	+/- 3%
Dissolved Oxygen	+/- 0.3 mg/l
Temperature	+/- 3%
ORP	+/- 10 mV

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If determined that the stabilization parameters could be met, a sample can be collected at the discretion of field personnel and documentation of this deficiency made on the log form. This conditions was not encountered during the October 2009 Event.

Once purging stabilization was achieved, the flow-through cell was detached from the pump discharge without affecting the pump flow rate. Pre-preserved sampling containers were filled directly from the pump tubing discharge. The pump flow rate was maintained at the same rate as it was during purging. Field filters were used only for the collection samples analyzed for dissolved metals samples.

Once the requisite sample containers were filled, the tops were securely closed and the samples immediately placed on ice. The samples were delivered under chain-of-custody to the laboratory.

Every effort was made to use new or dedicated materials during sampling. In any event that this was not possible, items were thoroughly decontaminated between wells. Decontamination procedures included the use of an Alconox and de-ionized water mixture followed by a de-ionized water rinse.

The validated groundwater quality results from the 2009 Annual Monitoring Event were added to the database presented as Table 2, for the purposes of comparison with historic results. The historical spatial distributions of BCEE, 1,2-dichloroethane (DCA), benzene, dissolved oxygen, dissolved iron, and dissolved manganese are plotted on Figures 3 through 8, respectively.

### **5.0 Surface-Water and Sediment Monitoring**

Surface-water and sediment samples were collected from Locations A, B, C, D, E and F, situated along Army Creek, as shown in Figure 1. The surface-water and sediment quality results from the 2009 Annual Monitoring Event were added to the databases presented as Tables 3 and 4, respectively.

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Surface-water samples were collected as grab samples using a decontaminated polyethylene beaker for sample collection. Samples were poured directly from the sample collection beaker into the laboratory sample bottles, with the exception of TAL metals. The TAL metals sample were pumped using a peristaltic pump from the sample collection beaker through a 0.45-micron filter into the laboratory bottle. New disposable polyethylene and silicon tubing and filter were used for TAL metal filtering at each sampling location. Sediment samples were collected using stainless-steel utensils to collect sediments and place them directly into soil sampling jars for delivery to the lab. Characteristics of the steam sample location (e.g., sediment and flow characteristics) at the time of sampling will be recorded on the field log form.

All bottles that required acid preservation were prepared by the laboratory. All samples were carefully packed into sample coolers with ice. At the end of each day, the samples were packed again with fresh ice and sent under chain-of custody via overnight courier to the laboratory.

### **6.0 Chain-of-Custody and Quality Assurance and Quality Control**

Once collected, all samples were kept under strict chain-of-custody (COC) procedures, documenting possession of the samples from collection to receipt by the laboratory. Quality assurance/quality control (QA/QC) samples were collected and analyzed in accordance with Table 3 of the EPA-approved plan (Appendix A). The analytical results for the QA/QC samples are provided in Table 5.

### **7.0 Future Activities**

The next semi-annual monitoring event will be conducted in April of 2010. In addition to program for the semi-annual monitoring event outlined in the EPA-approved plan, Monitoring Well MW-38N will also be monitored for dissolved lead and field parameters. The well abandonment program outlined in Table 2 attached to the May 4, 2009 EPA-approval letter (Appendix A), excluding the abandonment of MW-38N, will also be implemented in April of 2010. The treatment system will be maintained until January 2011, after which it is anticipated the iron treatment system will be decommissioned.

# **TABLES**

**Table 1**  
**Summary of Water-Level Elevations**  
**Vicinity of the Army Creek and Delaware Sand & Gravel Landfills**

	Pre-Suspension										Post-Suspension											
	08/27/04	09/27/04	11/09/04	01/12/05	04/22/05	07/11/05	10/24/05	01/20/06	04/21/06	07/10/06	10/06/06	01/08/07	04/20/07	07/23/07	10/09/07	01/14/08	04/14/08	07/14/08	10/20/08	01/15/09	04/17/09	10/12/09
<b>Monitoring/Recovery Wells</b>																						
MW-18	--	-15.52	-18.82	--	-0.88	-10.43	-15.48	-1.48	-6.22	-11.06	-10.96	-8.47	-10.32	-13.45	-15.23	-10.21	-10.50	-14.91	-12.46	-9.84	-7.82	-12.03
MW-22N	-22.27	-16.54	-22.20	-17.93	-3.71	-14.10	-21.39	-3.93	-10.68	-15.95	-15.60	-11.09	-14.97	-16.99	-18.22	-14.25	-15.35	-19.04	-15.94	-13.98	-11.82	-15.84
MW-26N	-27.35	-16.85	-27.19	-20.74	-4.03	-19.74	-24.97	-4.79	-13.27	-20.72	-17.65	-16.17	-19.06	-23.27	-24.91	-18.21	-18.78	-24.79	-19.81	-17.86	-14.03	-19.12
MW-28	-20.70	-16.97	-15.65	-10.26	0.46	-5.43	-11.82	-0.58	-3.59	-6.74	-8.88	-5.36	-5.23	-9.58	-11.34	-7.05	-7.14	-10.92	-9.80	-8.05	-5.69	-9.70
MW-29	-20.86	-18.88	-14.35	-8.62	1.11	-3.64	-8.45	0.24	-2.22	-4.78	-5.98	-3.58	-3.52	-7.10	-8.72	-6.19	-5.13	-8.01	-7.53	-6.08	-4.10	-7.42
MW-31	-30.95	-18.42	-12.71	-8.26	0.75	-3.50	-7.54	-0.21	-2.07	-4.40	-6.15	-3.40	-3.27	-6.36	-8.08	-4.93	-4.68	-7.15	-7.04	--	-3.75	-6.51
MW-40	-21.54	-16.76	-17.90	-12.84	-0.73	-8.76	-13.90	-1.50	-5.97	-10.23	-11.23	-7.97	-8.86	-12.47	-13.94	-9.48	-9.95	-14.03	-11.78	-10.09	--	-11.85
MW-49N	-24.75	-16.57	-24.64	-18.99	-3.46	-16.64	-18.41	-3.69	-11.65	-17.96	-16.12	-14.45	-16.69	-19.51	-21.19	-16.06	-16.90	-21.53	-17.32	-15.14	-12.52	-17.00
MW-54	-6.20	-4.31	-4.48	-1.88	5.16	2.47	0.01	5.38	3.95	2.01	1.41	3.96	3.11	1.95	0.93	2.25	2.28	0.71	0.78	1.61	2.32	0.54
MW-56	-14.00	-11.48	-9.41	-4.84	3.36	0.04	-3.56	2.49	1.00	-0.61	-2.29	0.56	0.24	-2.27	-3.91	-1.40	-1.14	-3.26	-3.57	-2.30	-1.14	-3.45
MW-58	-9.33	-8.02	-5.73	-2.56	2.92	1.40	-0.92	2.44	1.63	0.84	-0.59	1.49	1.64	-0.65	-2.26	-0.39	0.31	-1.28	-2.19	-1.09	-0.25	-1.84
P-4	-21.01	-16.16	-19.53	-15.63	-2.53	-11.38	-15.90	-2.84	-8.25	-13.00	-13.69	-10.41	-11.95	-14.15	-15.12	-11.49	-12.36	-15.97	-13.69	-12.05	-9.81	-13.71
P-5L	-23.23	-16.21	-19.48	-16.58	-1.98	-13.20	-18.23	-3.04	-8.61	-14.03	-13.45	-11.06	-12.76	-16.42	-18.17	-12.81	-13.31	-18.03	-14.98	-12.50	-10.00	-14.50
P-5U	-22.08	-16.39	-18.84	-13.75	-1.31	-10.36	-15.53	-2.33	-6.88	-11.38	-11.86	-9.12	-10.13	-14.07	-15.82	-10.87	-11.21	-15.59	-13.25	-11.12	-8.64	-12.90
P-6	-20.44	-17.02	-15.95	-10.73	-0.53	-6.59	-11.02	-1.39	-4.37	-7.54	-8.74	-6.01	-6.25	-9.71	-11.30	-7.59	-7.50	-10.63	-9.76	-8.18	-6.19	-9.62
RW10	-21.96	-15.66	-16.05	-11.30	-0.17	-6.95	-11.36	-0.96	-4.59	-8.21	-9.49	-6.20	-7.06	-10.00	-11.30	-7.61	-7.98	-11.36	-9.90	-8.51	-6.47	-10.06
BW-1	-23.98	-16.14	-22.22	--	-2.26	-14.17	-19.33	-3.21	-9.38	-15.07	-14.21	-11.94	-11.87	-17.42	-19.36	-13.72	-14.32	-19.19	-15.85	-13.28	-10.66	-15.27
BW-2	-23.71	-16.66	-21.56	-16.00	-2.18	-13.27	-18.06	-3.07	-8.83	-14.11	-13.78	-11.28	-12.89	-14.49	-18.30	-12.95	-13.53	-18.27	-15.20	-12.80	-10.23	-14.79
BW-3	-22.14	-16.95	-18.90	-13.58	-1.06	-9.88	-14.96	-1.95	-6.55	-10.97	-11.88	-8.92	-9.85	-13.74	-15.34	-10.46	-10.91	-15.28	-12.74	-10.78	-8.34	-11.88
<b>Surface Water</b>																						
SG-1	--	2.07	--	destroyed	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
SG-1B	--	not installed	--	not installed	1.14	0.75	0.90	1.22	0.88	0.99	1.56	--	1.25	0.83	0.31	1.32	0.92	0.28	-0.19	0.64	-0.15	1.06
SG-2	--	11.52	--	dry	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
SG-2B	--	not installed	--	not installed	dry	dry	< 11.84	< 11.84	< 11.35	< 11.41	11.34	12.04	< 11.11	11.17	< 11.44	< 11.29	< 11.20	--	12.13	--	--	--
SG-3	--	10.60	--	10.77	dry	10.46	< 10.91	< 10.78	< 10.68	10.70	12.24	--	< 11.02	< 12.15	< 11.01	< 10.70	--	--	--	--	--	--
SG-4	--	not installed	--	not installed	1.46	1.76	1.46	--	1.66	1.50	1.93	2.50	1.66	1.42	1.43	1.67	2.38	2.39	2.32	2.72	3.29	2.28
SG-5	--	not installed	--	not installed	1.49	1.75	1.46	--	1.44	1.19	1.64	2.26	1.29	1.02	< 0.89	1.26	2.22	2.25	1.86	2.20	--	1.75
<b>Liangollen Supply Wells</b>																						
AWC-2	-34.12	-18.32	-24.05	-34.57	-8.72	-31.22	-32.22	-7.52	-24.37	-29.17	-27.42	-24.72	-27.02	-20.87	-19.52	-26.42	-28.37	-29.12	-21.12	-17.22	-16.62	--
AWC-6	-21.49	-18.59	-26.89	-27.34	-7.69	-24.99	-25.19	-7.19	-17.94	-24.39	-23.09	-23.09	-24.64	-25.09	-22.09	-23.09	-25.94	-28.09	-24.39	-18.29	-18.94	--
AWC-7	-21.47	-18.57	-28.22	-37.62	-7.82	-35.12	-26.92	-6.92	-25.92	-25.67	-24.42	-34.42	-35.47	-34.52	-23.32	-32.02	-38.32	-36.92	-33.42	-18.82	-26.72	--
AWC-G3	-47.32	-11.32	-50.87	-44.67	-5.46	-42.27	-50.66	-6.36	-39.02	-49.07	-44.47	-45.08	-46.82	-56.13	-54.77	-55.30	-64.88	-70.44	-72.74	-70.02	-76.87	--
AWC-K1	-49.29	-16.84	-47.29	-42.49	-4.17	-43.47	-60.14	-5.39	-44.36	-56.39	-50.49	-48.32	-55.94	-62.42	-64.46	-56.55	-65.34	-60.64	-59.46	-57.44	-57.55	--
AWC-MW2R	-33.58	-33.58	-35.84	--	-6.09	-30.24	-34.48	-7.07	-14.52	-34.37	--	-21.41	-24.87	-32.34	-32.39	-21.29	-22.61	-28.44	-27.04	--	-10.34	--

Note - All water level measurements in ft. msl

- Not measured

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**Table 2**

-- Not analyzed or data not available to RAI as of February 2, 2010

U - Analyte was not detected above the reporting limit

J - Estimated concentration.

K - Analyte present, reported value may be biased high.

L - Analyte present, reported value may be biased low.

UL - Not detected, quantitation limit is probably higher

D - Sample diluted in the la-

NP - Well not pumping

P - Discrepancy in GC analysis. Lower w

Table 2 (continued)

Historical Summary of Groundwater Quality Data Collected by New Castle County for the Vicinity of the Army Creek and Delaware Sand &amp; Gravel Landfills

Parameter	MW-28																																		
	6/93	6/94	6/95	6/96	6/97	6/98	6/99	7/00	10/00	12/00	4/01	7/01	10/01	1/02	4/02	7/02	10/02	1/03	10/04	1/05	4/05	7/05	10/05	1/06	4/06	7/06	10/06	1/07	4/07	10/07	4/08	10/08	4/09	10/09	
<b>Non-Halogenated VOCs (µg/l)</b>																																			
Benzene	5 U	5 U	1.5	1.7	1.2	1.3	1.6	0.5 J	--	--	0.2 J	0.6 J	--	--	--	0.8 J	--	--	0.5 U	5 U	5 U	1 J	10 U	1 U	1 U	1.9	1 U	1 U	2.8	0.58 J	2.8	1 U	3.1		
Toluene	--	--	--	--	--	--	--	--	--	0.1 B	0.2 J	--	--	--	--	--	--	0.5 U	5 U	5 U	5 U	10 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U
Ethylbenzene	--	--	--	--	--	--	--	--	--	--	1 U	1 U	--	--	--	--	--	0.5 U	5 U	5 U	5 U	10 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U
Xylene (total)	--	--	--	--	--	--	--	--	--	--	1 U	1 U	--	--	--	--	--	0.5 U	5 U	5 U	5 U	10 U	3 U	3 U	3 U	3 U	3 U	3 U	3 U	3 U	3 U	3 U	3 U	3 U	
2-Butanone	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	5 U	10 U	10 R	10 U	10 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	
Acetone	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	0.5 U	5 U	5 U	5 U	10 U	20 R	20 R	20 R	20 R	20 R	20 R	20 R	20 R	20 R	20 R	20 R	20 R	
Carbon Disulfide	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	0.5 U	5 U	5 U	5 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	
Cyclohexane	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	0.5 U	--	--	--	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U		
Isopropylbenzene	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	0.49 J	--	--	--	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U		
Methyl-tert-butyl ether	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	0.5 U	--	--	--	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U		
Methylcyclohexane	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	5 U	10 U	10 U	10 U	10 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	
4-Methyl-2-pentanone	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U		
<b>Halogenated VOCs (µg/l)</b>																																			
Bromoform	--	--	--	--	--	--	--	--	--	--	1 U	1 U	--	--	--	--	--	0.25 J	5 U	5 U	5 U	10 UJ	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	
Bromodichloromethane	--	--	--	--	--	--	--	--	--	--	1 U	1 U	--	--	--	--	--	0.5 U	5 U	5 U	5 U	10 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	
Carbon Tetrachloride	5 U	5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	--	1 U	1 U	--	--	--	--	--	0.5 U	5 U	5 U	5 U	10 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U		
Chlorobenzene	--	--	--	--	--	--	--	--	--	--	1	5	--	--	--	--	--	0.11 J	5 U	5 U	5 U	6	10 U	1 U	0.37 J	11	0.33 J	1 U	16	4.1	17	1.9	24		
Chloroform	--	--	--	--	--	--	--	--	--	--	1 U	1 U	--	--	--	--	--	0.5 U	5 U	5 U	5 U	10 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	
Dibromo-chloromethane	--	--	--	--	--	--	--	--	--	--	1 U	1 U	--	--	--	--	--	0.5 U	5 UJ	5 U	5 U	10 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	
1,2-Dichloroethane	5 U	5 U	0.5 U	0.2 J	1.3	5.3	0.5 J	0.1 J	--	--	3	1 U	--	--	--	--	--	0.16 J	5 U	5 U	5 U	5 U	10 U	1 U	0.15 J	1 U	0.33 J	1 U	0.23 J	1 U	1 U				
1,3-Dichlorobenzene	--	--	--	--	--	--	--	--	--	--	1 U	0.2 J	--	--	--	--	--	0.5 U	5 U	5 U	5 U	1 J	10 U	1 U	1 U	14	1 U	1 U	1.7	0.53 J	1.5	1 U	1.8		
1,1-Dichloroethane	--	--	--	--	--	--	--	--	--	--	1 U	0.1 J	--	--	--	--	--	0.5 U	5 U	5 U	5 U	10 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U		
cis-1,2-Dichloroethene	--	--	--	--	--	--	--	--	--	--	1 U	1 U	--	--	--	--	--	0.5 U	5 U	5 U	5 U	10 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	
trans-1,2-Dichloroethene	--	--	--	--	--	--	--	--	--	--	1 U	1 U	--	--	--	--	--	0.5 U	5 U	5 U	5 U	10 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	
1,1-Dichloroethene	5 U	5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.4 J	0.1 J	--	1 U	1 U	--	--	--	--	--	0.5 U	5 U	5 U	5 U	5 U	10 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	
1,2-Dichloroethene (total)	--	--	--	--	--	--	--	--	--	--	2 U	2 U	--	--	--	--	--	0.5 U	5 U	5 U	5 U	10 U	1 U	0.43 J	1 U	1 U	0.7 J	0.20 J	0.75 J	1 U	1.1				
1,2-Dichlorobenzene	--	--	--	--	--	--	--	--	--	--	1 U	0.2 JB	--	--	--	--	--	0.5 U	5 U	5 U	5 U	10 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U		
1,3-Dichlorobenzene	--	--	--	--	--	--	--	--	--	--	1 U	1 U	--	--	--	--	--	0.5 U	5 U	5 U	5 U	10 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U		
1,4-Dichlorobenzene	5 U	--	3.1	2.9	2.2	3.3	3.6	1.5	--	--	0.3 B	2	--	--	--	--	--	0.5 U	5 U	5 U	5 U	10 U	1 R	1 U	0.57 J	1 U	1 U	1 U	0.38 J	1 U	0.86 J				
Chloroethane	--	--	--	--	--	--	--	--	--	--	3	0.3 J	--	--	--	--	--	0.5 U	5 U	5 U	5 U	10 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U		
Tetrachloroethene	--	--	--	--	--	--	--	--	--	--	1 U	1 U	--	--	--	--	--	0.5 U	5 U	5 U	5 U	10 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U		
1,1,1-Trichloroethane	5 U	5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	--	1 U	1 U	--	--	--	--	--	0.5 U	5 U	5 U	5 U	10 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U			
Trichloroethene	5 U	5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	--	1 U	1 U	--	--	--	--	--	0.5 U	5 U	5 U	5 U	10 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U			
Vinyl Chloride	5 U	5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	--	1 U	0.7 J	--	--	--	--	--	0.5 U	5 U	5 U	5 U	10 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U			
1,2,4-Trichlorobenzene	--	--	--	--	--	--	--	--	--	--	1 U	1 U	--	--	--	--	--	0.5 U	5 U	5 U	5 U	10 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U		
cis-1,3-Dichloropropene	--	--	--	--	--	--	--	--	--	--	1 U	1 U	--	--	--	--	--	0.5 U	5 U	5 U	5 U	10 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U		
Methylene Chloride	--	--	--	--	--	--	--	--	--	--	1 U	1 U	--	--	--	--	--	0.62 U	5 U	5 U	5 U	10 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U		
Trichlorofluoromethane	--	--	--	--	--	--	--	--	--	--	1 U	1 U	--	--	--	--	--	0.5 U	--	--	--	10 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U		
<b>Semi-Volatiles (µg/l)</b>																																			
Bis(2-chloroethyl)Ether	--	--	--	--	--	--	--	--	--	--	1.0900	0.81	1	2 J	2.2	1.3	0.96	0.98	0.37	0.23	0.2	0.076	0.06	0.046	0.02 U	0.3	5 U	5 U	5 U	5 U	5 U	6.9	5 U	5.1 U	5.0 U
Bis(2-ethylhexyl)phthalate	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	5 UJ	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	
2,2'-oxybis(1-Chloropropane)	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	
2,4-Dimethylphenol	--	--	--	--	--</td																														

RUTH ASSOCIATES INC.

Table 3 (continued)

Historical Summary of Groundwater Quality Data Collected by New Castle County for the Vicinity of the Army Creek and Delaware Sand & Gravel Landfills

Net cash used in debt activities by PAAI as of February 2, 2018

-- Not analyzed or data not available to RAI as of February 11. Anakita was not detected above the reporting limit.

U - Analyte was not detected  
I - Estimated concentration

J - Estimated concentration.

K - Analyte present, reported value may be biased high

L - Analyte present, reported value may be biased low.

D. Samples diluted in the lab for analysis

D - Sample diluted in the  
NP - Wall solution

NP - Well not pumping

P - Discrepancy in GC analysis. Lower P - Acute to Patients His Mother's Blood

Table 2 (continued)

Historical Summary of Groundwater Quality Data Collected by New Castle County for the Vicinity of the Army Creek and Delaware Sand &amp; Gravel Landfills

Parameter	MW-31																																								
	6/93	6/94	6/95	6/96	6/97	6/98	6/99	7/00	10/00	12/00	4/01	7/01	10/01	1/02	4/02	7/02	10/02	1/03	4/03	7/03	7/04	10/04	1/05	4/05	7/05	10/05	1/06	4/06	7/06	10/06	1/07	4/07	10/07	10/08	10/09						
<b>Non-Halogenated VOCs (µg/l)</b>																																									
Benzene	5 U	5 U	0.3 J	43	0.5 U	0.5 U	0.5 U	0.1 J	--	--	0.8 J	0.6 J	--	--	0.5 U	--	--	--	0.5 U	0.4 J	6.1	5 U	5 U	5 U	10 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U									
Toluene	--	--	--	--	--	--	--	--	--	--	1 U	0.5 J	--	--	--	--	--	--	0.5 U	0.5 U	0.5 U	5 U	5 U	10 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U								
Ethylbenzene	--	--	--	--	--	--	--	--	--	--	1 U	1 U	--	--	--	--	--	--	0.5 U	0.5 U	0.5 U	5 U	5 U	10 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U								
Xylene (total)	--	--	--	--	--	--	--	--	--	--	1 U	1 U	--	--	--	--	--	--	1.0 U	1.0 U	0.46 J	5 U	5 U	10 U	10 U	3 U	3 U	3 U	3 U	3 U	3 U	3 U	3 U								
2-Butanone	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	5 U	10 U	10 U	10 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U										
Acetone	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	0.5 U	0.5 U	0.5 U	5 U	5 U	10 U	10 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U								
Carbon Disulfide	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	0.14 J	--	--	--	--	--	--	--	--	--	--	--	--									
Cyclohexane	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	0.25 J	--	--	--	--	--	--	--	--	--	--	--	--	--									
Isopropylbenzene	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	1.9	--	--	--	25	24	24	25	21	22	38.9	0.36 J	0.42 J									
Methyl-tert-butyl ether	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	10 U	10 U	10 U	10 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U										
Methylcyclohexane	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	10 U	10 U	10 U	10 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U										
4-Methyl-2-pentanone	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	5 U	10 U	10 U	10 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U										
<b>Halogenated VOCs (µg/l)</b>																																									
Bromform	--	--	--	--	--	--	--	--	--	--	1 U	1 U	--	--	--	--	--	--	0.5 U	0.5 U	0.5 U	5 U	5 U	10 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U								
Bromodichloromethane	--	--	--	--	--	--	--	--	--	--	1 U	1 U	--	--	--	--	--	--	0.5 U	0.5 U	0.5 U	5 U	5 U	10 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U								
Carbon Tetrachloride	5 U	5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	--	1 U	1 U	--	--	--	--	--	0.5 U	0.5 U	0.5 U	5 U	5 U	10 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U									
Chlorobenzene	--	--	--	--	--	--	--	--	--	--	5	2	--	--	--	--	--	--	0.1 J	0.1 J	3.9	5 U	5 U	10 U	1 U	1 U	0.41 J	0.31 J	0.92 J	1.1	0.18 J										
Chloroform	--	--	--	--	--	--	--	--	--	--	1 U	0.2 J	--	--	--	--	--	--	0.5 U	0.5 U	0.5 U	5 U	5 U	10 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U								
Dibromochloromethane	--	--	--	--	--	--	--	--	--	--	1 U	1 U	--	--	--	--	--	--	0.5 U	0.5 U	0.5 U	5 U	5 U	10 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U								
1,2-Dichloroethane	5 U	5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	--	1 U	1 U	--	--	--	--	--	0.5 U	0.5 U	0.5 U	5 U	5 U	10 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U									
1,3-Chlorobenzene	--	--	--	--	--	--	--	--	--	--	0.2 J	1 U	--	--	--	--	--	--	0.5 U	0.5 U	0.22 J	5 U	5 U	10 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U								
1,1-Dichloroethane	--	--	--	--	--	--	--	--	--	--	0.2 J	1 U	--	--	--	--	--	--	0.5 U	0.5 U	0.11 J	5 U	5 U	10 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U								
cis-1,2-Dichloroethene	--	--	--	--	--	--	--	--	--	--	1 U	1 U	--	--	--	--	--	--	0.5 U	0.5 U	0.31 J	5 U	5 U	10 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	0.25 J								
trans-1,2-Dichloroethene	--	--	--	--	--	--	--	--	--	--	0.1 J	1 U	--	--	--	--	--	--	0.5 U	0.5 U	0.18 K	5 U	5 U	10 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U								
1,1-Dichloroethene	5 U	5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	--	1 U	1 U	--	--	--	--	--	0.5 U	0.5 U	0.17 J	5 U	5 U	10 U	1 U	1 U	0.39 J	0.37 J	0.34 J	0.61 J	1.2	1.4									
1,2-Dichloroethene (total)	--	--	--	--	--	--	--	--	--	--	2 U	2 U	--	--	--	--	--	--	1.0 U	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--				
1,2-Dichlorobenzene	--	--	--	--	--	--	--	--	--	--	0.1 J	1 U	--	--	--	--	--	--	0.5 U	0.5 U	0.15 J	5 U	5 U	10 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U								
1,3-Dichlorobenzene	--	--	--	--	--	--	--	--	--	--	1 U	1 U	--	--	--	--	--	--	0.5 U	0.5 U	0.5 U	5 U	5 U	10 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U								
1,4-Dichlorobenzene	5 U	--	0.2 J	0.4 J	0.5 U	0.5 U	0.4 J	0.5 J	--	--	0.7 B	0.6 J	--	--	--	--	--	--	0.5 U	0.5 U	0.31 J	5 U	5 U	10 U	1 U	1 U	0.39 J	0.47 J	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U							
Chloroethane	--	--	--	--	--	--	--	--	--	--	1 U	1 U	--	--	--	--	--	--	0.5 U	0.5 U	0.18 K	5 U	5 U	10 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U								
Tetrachloroethene	--	--	--	--	--	--	--	--	--	--	1 U	1 U	--	--	--	--	--	--	0.5 U	0.5 U	0.17 J	5 U	5 U	10 U	1 U	1 U	0.39 J	0.37 J	0.34 J	0.61 J	1.2	1.4									
1,1,1-Trichloroethane	5 U	5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	--	1 U	1 U	--	--	--	--	--	0.5 U	0.5 U	0.15 J	5 U	5 U	10 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U									
Trichloroethene	5 U	5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	--	1 U	1 U	--	--	--	--	--	0.5 U	0.5 U	0.13 J	5 U	5 U	10 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U									
Vinyl Chloride	5 U	5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	--	1 U	1 U	--	--	--	--	--	0.5 U	0.5 U	0.13 J	5 U	5 U	10 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U									
1,2,4-Trichlorobenzene	--	--	--	--	--	--	--	--	--	--	1 U	1 U	--	--	--	--	--	--	0.5 U	0.5 U	0.15 J	5 U	5 U	10 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U								
cis-1,3-Dichloropropene	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	0.5 U	0.5 U	0.15 J	5 U	5 U	10 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U							
Methylene Chloride	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	0.5 U	0.5 U	0.15 J	5 U	5 U	10 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U							
Trichlorofluoromethane	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	0.5 U	0.5 U	0.15 J	5 U	5 U	10 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U							
<b>Inorganics (mg/l)</b>																																									
Dissolved Manganese	--	--	--	--	--	--	--	--	--	--	0.1272	0.13	16 D	21	4 NP	20	0.053	0.16	0.23	0.079	0.1	0.1	0.1	0.1	0.1	0.099	0.0095 J	0.019 J	0.099	0.018 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U
Dissolved Iron	10.90	--	0.45	3.30	9.30	7.60	--	0.24	0.56	3.36	--	--	--	--	--	--	--	--	17.2	7.12	--	--	6.08	--	--	--	12.9	0.47	1.2	1.3	< 1	< 2	< 2	< 2	< 2	< 2	< 2	< 2	< 2	< 2	< 2
<b>Biological Oxygen Demand (mg/l)</b>	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--		
<b>Field Parameters</b>																																									
Temperature (Degrees Celsius)	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	12.36	14.95	--	--	24.26	18.36	--	--	14.20	13.00	13.47	14.13	13.31	14.2	14.6	14.4	14.0	14.3	14.5	14.2	13.9		
Conductivity (µs/cm)	--	--	--	--	--																																				

RUTH ASSOCIATES, INC.

**Table 2 (continued)**

-- Not analyzed or data not available to RAI as of February 2, 2010

**U** - Analyte was not detected above the reporting limit

J - Estimated concentration.

K - Analyte present, reported value may be biased high.

L - Analyte present, reported value may be biased low.

UL - Not detected, quantitation limit is probably higher

D - Sample diluted in the lab for analysis.

NP - Well not pumping

P - Discrepancy in GC analysis. Lower value reported

#### B - Analyte Detected in Method Blank

## R - Data Rejected

Table 2 (continued)

Historical Summary of Groundwater Quality Data Collected by New Castle County for the Vicinity of the Army Creek and Delaware Sand &amp; Gravel Landfills

Parameter	MW-40																																	
	9/99	12/99	3/00	7/00	10/00	12/00	4/01	7/01	10/01	1/02	4/02	7/02	10/02	1/03	4/03	7/03	10/03	1/04	4/04	7/04	10/04	1/05	4/05	7/05	10/05	1/06	4/06	7/06	10/06	1/07	4/07	7/07	10/07	1/08
<b>Non-Halogenated VOCs (µg/l)</b>																																		
Benzene	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.2 J	0.5 U	0.5 U	1 U	0.5 U	0.3 J	0.1 J	0.5 U	0.2 J	0.3 J	0.5 U	0.5 U	0.5 U	0.6	0.5	0.23 J	5 U	5 U	5 U	10 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U		
Toluene	--	--	--	--	--	--	--	--	--	0.5 U	--	--	--	--	--	5 U	0.5 U	--	0.5 U	0.5 U	0.5 U	5 U	5 U	5 U	10 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U		
Ethylbenzene	--	--	--	--	--	--	--	--	--	1 U	--	--	--	--	--	5 U	0.5 U	--	1.0 U	0.5 U	1.0 U	5 U	5 U	5 U	10 U	3 U	3 U	3 U	3 U	3 U	3 U	3 U		
Xylene (total)	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	5 U	0.075 J	--	--	--	--	5 U	5 U	5 U	10 U	3 U	3 U	3 U	3 U	3 U	3 U	3 U		
2-Butanone	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	5 U	10 R	10 U	10 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U			
Acetone	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	5 U	20 R	20 U	20 R	10 U	5 U	5 U	5 U	5 U	5 U	5 U			
Carbon Disulfide	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	5 U	5 U	5 U	10 U	1 U	1 U	1 U	1 U	1 U	1 U				
Cyclohexane	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	5 U	5 U	5 U	10 U	1 U	1 U	1 U	1 U	1 U	1 U				
Methylcyclohexane	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	5 U	5 U	5 U	10 U	1 U	1 U	1 U	1 U	1 U	1 U				
Methyl-tert-butyl ether	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	5 U	3.7	--	--	--	2.3 J	1.7	0.98 J	0.98 J	0.45 J	0.52 J	0.53 J		
Methylcyclohexane	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	5 U	10 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U			
4-Methyl-2-pentanone	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	5 U	10 U	10 U	10 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U			
<b>Halogenated VOCs (µg/l)</b>																																		
Bromform	2 U	2 U	2 U	2 U	2 U	2 U	2 U	2 U	2 U	2 U	2 U	2 U	2 U	2 U	2 U	2 U	2 U	2 U	2 U	2 U	0.16 J	5 U	5 U	5 U	10 U	1 U	1 U	1 U	1 U	1 U	1 U			
Bromodichloromethane	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	5 U	5 U	5 U	10 U	1 U	1 U	1 U	1 U	1 U	1 U				
Carbon Tetrachloride	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	5 U	5 U	5 U	10 U	1 U	1 U	1 U	1 U	1 U	1 U				
Chlorobenzene	--	--	--	--	--	--	--	--	--	0.5 U	--	--	--	--	--	5 U	0.5 U	--	0.1 J	0.34 J	5 U	5 U	5 U	10 U	1 U	1 U	1 U	1 U	1 U	1 U				
Chloroform	0.5 U	0.2 J	0.5 U	0.5 U	0.5 U	0.5 U	0.2 J	0.1 B	0.1 J	0.2 J	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	5 U	5 U	5 U	10 U	1 U	1 U	1 U	1 U	1 U	1 U				
Chloromethane	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	5 U	5 U	5 U	10 U	0.43 J	0.43 J	0.20 J	1 U	1 U	1 U				
Dibromochloromethane	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	5 U	5 U	5 U	10 U	1 U	1 U	1 U	1 U	1 U	1 U			
1,2-Dichloroethane	0.5 U	0.5 U	5.0	0.1 J	0.5 U	0.5 U	0.2 J	0.1 J	0.5 U	0.5 U	37.0	13.0	0.5 U	24.0	19	0.5 U	1.8	0.5 U	73	68 D	32 D	7	5 J	5 U	10 U	1 U	0.21 J	0.12 J	1 U	1 U	1 U	1 U		
1,3 Chlorobenzene	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--			
cis-1,2-Dichloroethane	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U			
trans-1,2-Dichloroethene	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U			
1,1-Dichloroethene	0.5 U	0.5 U	0.2 J	0.2 JB	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	5 U	5 U	5 U	10 U	1 U	1 U	1 U	1 U	1 U	1 U				
1,2-Dichlorobenzene	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U			
1,3-Dichlorobenzene	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U			
1,4-Dichlorobenzene	0.2 J	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U			
Chloroethane	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U			
Tetrachloroethene	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U			
1,1,1-Trichloroethane	0.5	0.3 J	0.4 J	0.3 J	0.3 J	0.5 U	0.6	0.6	0.6	0.6	0.6	0.4 J	0.6	0.6	0.7	0.82 B	1	1.1	0.6	0.5 J	0.78	0.8 J	1 J	1 J	1 J	0.31 J	0.60 J	0.69 J	0.72 J	0.70 J	0.59 J	0.31 J		
Trichloroethene	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	5 U	5 U	5 U	10 U	1 U	1 U	1 U	1 U	1 U	1 U				
Vinyl Chloride	0.5 U	0.5 U	0.3 J	0.1 J	0.5 U	0.6	0.1 J	0.5 U	0.5 U	0.5 U	1.1	0.4 J	0.7	1 J	0.5 U	0.3 J	0.1 J	2	1.9	1.7	5 U	5 U	5 U	10 U	1 U	1 U	1 U	1 U	1 U	1 U				
1,2,4-Trichlorobenzene	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U			
cis-1,3-Dichloropropene	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U			
Methylene Chloride	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U			
Trichlorofluoromethane	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U			
<b>Semi-Volatiles (µg/l)</b>																																		
Bis(2-chloroethyl)Ether	--	--	--	0.06892	0.022 J	0.67	0.1	0.077	0.024 U	0.024 U	0.97	1.1	0.041 J	0.7	0.8	0.2	--	--	--	--	2.5 J	0.26 B	0.14	0.083	0.019 U	0.67	0.46	0.33	0.24	0.043	0.018 U	5 U	5.3 U	5.0 U
Bis(2-ethylhexyl)phthalate	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	5 U	64	5 U	62	16 J	5 U	5 U	5 U	5 U	5 U	5 U	5 U			
2,2'-oxybis (1-Chloropropane)	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U				
2,4-Dimethylphenol	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U				
2-Methylnaphthalene	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U				
2-Methylphenol	--	--	--	--																														

**Table 2 (continued)**

-- Not analyzed or data not available to BAI as of February 2, 2010

-- Not analyzed or data not available to RAI as of February 2000  
U - Analyte was not detected above the reporting limit

J - Estimated concentration.

K - Analyte present, reported value may be biased high.

L - Analyte present, reported value may be biased low.

UL - Not detected, quantitation limit is probably higher

D - Sample diluted in the lab for analysis.

NP - Well not pumping

P - Discrepancy in GC analysis. Lower value reported

**B - Analyte Detected in Method Blank**

R - Data Rejected

**Table 2 (continued)**

-- Not analyzed or data not available to RAI as of February 2, 2010

**U** - Analyte was not detected above the reporting limit

J - Estimated concentration.

K - Analyte present, reported value may be biased high.

L - Analyte present, reported value may be biased low.

R - Data rejected

D - Sample diluted in the lab for analysis.

NP - Well not pumping

P - Discrepancy in GC analysis. Lower value reported

**B - Analyte Detected in Method Blanks**

UL - Not detected, quantitation limit is probably higher

**Table 2**

-- Not analyzed or data not available to RAI as of February 2, 2010

U - Analyte was not detected above the reporting limit

J - Estimated concentration.

K - Analyte present, reported value may be biased high.

L - Analyte present, reported value may be biased low

UL - Not detected, quantitation limit is probably higher

SE Not detected; quantitation limit is probably higher.

## R - Data Rejected

D - Sample diluted in the lab for analysis.

NP - Well not pumping

P - Discrepancy in GC analysis. Lower value reported

**B - Analyte Detected in Method Blank**

Table 2 (continued)

**Table 2 (continued)**  
Historical Summary of Groundwater Quality Data Collected by New Castle County for the Vicinity of the Army Creek and Delaware Sand & Gravel Landfills

-- Not analyzed or data not available to RAI as of February 3, 2010

II - Analyte was not detected above the reporting limit

J - Estimated concentration

K - Analyte present, reported value may be biased high.

L - Analyte present, reported value may be biased low

UL - Not detected, quantitation limit is probably higher

For more information about the study, please contact Dr. John P. Morrissey at (212) 639-7330 or via e-mail at [jmorrissey@nyp.edu](mailto:jmorrissey@nyp.edu).

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D - Sample diluted in th

NP - Well not pumping

P - Discrepancy in GC analysis. Lower

B - Analyte Detector

**Table 2 (continued)**

-- Not analyzed or data not available to RAI as of February 2, 2010

R - Data Rejected

U - Analyte was not detected above the reporting limit

J - Estimated concentration

K - Analyte present, reported value may be biased high.

L - Analyte present, reported value may be biased low.

UL - Not detected, quantitation limit is probably higher

D - Sample diluted in the lab for analysis.

NP - Well not pumping

#### P - Discrepancy in GC and

### B - Analyte Detected in M

**Table 2 (continued)**

-- Not analyzed or data not available to RAI as of February 2, 2010

U - Analyte was not detected above the reporting limit

J - Estimated concentration.

K - Analyte present, reported value may be biased high.

L - Analyte present, reported value may be biased low

UL - Not detected, quantitation limit is probably higher

R - Data Rejected

D - Sample diluted in the lab for analysis.

NP - Well not pumping

P - Discrepancy in GC analysis. Lower value reported

**B - Analyte Detected in Method Blank**

Table 2 (continued)

Table 2 (continued)

-- Not analyzed

U - Analyte was not detected above the reporting limit

J - Estimated concentration.

K - Analyte present, reported value may be biased high.

L - Analyte present, reported value may be biased low.

UL - Not detected, quantitation limit is probably higher

D - Sample diluted in the lab for analysis.

NP - Well not pumping

P - Discrepancy in GC analysis. Lower value reported

**B - Analyte Detected in Method Blank**

R - Data Rejected

**Table 3**  
Summary of Surface-Water Quality Data for Army Creek and Army Pond

Parameter	SWA												SWB												
	10/04	1/05	4/05	7/05	10/05	1/06	4/06	7/06	10/06	1/07	4/07	10/09	10/04	1/05	4/05	7/05	10/05	1/06	4/06	7/06	10/06	1/07	4/07	10/09	
<b>Non-Halogenated VOCs (µg/l)</b>																									
Benzene	0.44 J	5 U	5 U	5 UJ	5 UJ	10 U	1 U	1 U	1 U	1 U	1 U	--	0.51	2 J	5 U	5 U	5 U	10 U	1 U	1 U	1 U	1 U	1 U	1 U	--
Toluene	0.25	5 U	5 U	5 UJ	5 UJ	10 U	0.30 J	1 U	1 U	1 U	1 U	--	0.2	0.8 J	5 U	5 U	5 U	10 U	0.28 J	0.19 J	1 U	1 U	1 U	1 U	--
Ethylbenzene	0.5 U	5 U	5 U	5 UJ	5 UJ	10 U	1 U	1 U	1 U	1 U	1 U	--	0.5 U	5 U	5 U	5 U	10 U	1 U	1 U	1 U	1 U	1 U	1 U	--	
Xylene (total)	0.5 U	5 U	5 U	5 UJ	5 U	10 U	3 U	3 U	3 U	3 U	3 U	--	0.5 U	5 U	5 U	5 U	10 U	3 U	3 U	3 U	3 U	3 U	3 U	--	
2-Butanone	5 U	10 R	10 R	10 R	10 UJ	10 U	5 U	5 U	5 U	5 U	5 U	--	5 U	10 R	10 R	10 U	10 U	5 U	5 U	5 U	5 U	5 U	5 U	--	
Acetone	5.8 U	20 R	20 R	20 R	20 R	1.5 J	5 UU	8.7 U	5 U	5 U	5 U	--	9.6	20 R	20 R	7 J	20 R	1.5 J	5 UJ	8.2 U	5 U	5 U	5 U	5 U	--
Carbon Disulfide	0.21 J	5 U	5 U	5 UJ	5 UJ	10 U	1 U	1 U	1 U	1 U	1 U	--	0.23 J	5 U	5 U	5 U	10 U	1 U	1 U	1 U	1 U	1 U	1 U	--	
Cyclohexane	0.5 U	--	--	--	--	10 U	1 U	1 U	1 U	1 U	1 U	--	0.5 U	--	--	--	10 U	1 U	1 U	1 U	1 U	1 U	1 U	--	
Isopropylbenzene	0.5 U	--	--	--	--	10 U	1 U	1 U	1 U	1 U	1 U	--	0.5 U	--	--	--	10 U	1 U	1 U	1 U	1 U	1 U	1 U	--	
Methyl-tert-butyl ether	0.5	--	--	--	--	10 U	1 U	1 U	1 U	1 U	1 U	--	0.52	--	--	--	10 U	1 U	1 U	1 U	1 U	1 U	1 U	--	
Methylcyclohexane	0.5 U	--	--	--	--	10 U	1 U	1 U	1 U	1 U	1 U	--	0.5 U	--	--	--	10 U	1 U	1 U	1 U	1 U	1 U	1 U	--	
4-Methyl-2-pentanone	5 U	10 U	10 U	10 UJ	10 U	10 U	5 U	5 U	5 U	5 U	5 U	--	5 U	10 U	10 U	10 U	10 U	5 U	5 U	5 U	5 U	5 U	5 U	--	
<b>Halogenated VOCs (µg/l)</b>																									
Bromoform	0.5 U	5 U	5 U	5 UJ	5 UJ	10 UJ	1 U	1 U	1 U	1 U	1 U	--	0.5 U	5 U	5 U	5 U	10 UU	1 U	1 U	1 U	1 U	1 U	1 U	1 U	--
Bromodichloromethane	0.5 U	5 U	5 U	5 UJ	5 UJ	10 U	1 U	1 U	1 U	1 U	1 U	--	0.5 U	5 U	5 U	5 U	10 U	1 U	1 U	1 U	1 U	1 U	1 U	--	
Carbon Tetrachloride	0.5 U	5 U	5 U	5 UJ	5 UJ	10 U	1 U	1 U	1 U	1 U	1 U	--	0.5 U	5 U	5 U	5 U	10 U	1 U	1 U	1 U	1 U	1 U	1 U	--	
Chlorobenzene	1.4	5 U	5 U	5 UJ	5 UJ	10 U	1 U	1 U	1 U	1 U	1 U	--	1.7	6	5 U	5 U	10 U	1 U	1 U	1 U	1 U	1 U	1 U	--	
Chloroform	0.5 U	5 U	5 U	5 UJ	5 UJ	10 U	1 U	1 U	1 U	1 U	1 U	--	0.5 U	5 U	5 U	5 U	10 U	1 U	1 U	1 U	1 U	1 U	1 U	--	
Dibromochloromethane	0.5 U	5 U	5 U	5 UJ	5 UJ	10 U	1 U	1 U	1 U	1 U	1 U	--	0.5 U	5 U	5 U	5 U	10 U	1 U	1 U	1 U	1 U	1 U	1 U	--	
1,2-Dichloroethane	0.5 U	5 U	5 U	5 UJ	5 UJ	10 U	1 U	1 U	1 U	1 U	1 U	--	0.5 U	5 U	5 U	5 U	10 U	1 U	1 U	1 U	1 U	1 U	1 U	--	
1,1-Dichloroethane	0.5 U	5 U	5 U	5 UJ	5 UJ	10 U	1 U	1 U	1 U	1 U	1 U	--	0.5 U	5 U	5 U	5 U	10 U	1 U	1 U	1 U	1 U	1 U	1 U	--	
cis-1,2-Dichloroethene	0.5 U	5 U	5 U	5 UJ	5 UJ	10 U	1 U	1 U	1 U	1 U	1 U	--	0.5 U	5 U	5 U	5 U	10 U	1 U	1 U	1 U	1 U	1 U	1 U	--	
trans-1,2-Dichloroethene	0.5 U	5 U	5 U	5 UJ	5 UJ	10 U	1 U	1 U	1 U	1 U	1 U	--	0.5 U	5 U	5 U	5 U	10 U	1 U	1 U	1 U	1 U	1 U	1 U	--	
1,1-Dichloroethene	0.11 J	5 U	5 U	5 UJ	5 UJ	10 U	1 U	1 U	1 U	1 U	1 U	--	0.5 U	5 U	5 U	5 U	10 U	1 U	1 U	1 U	1 U	1 U	1 U	--	
1,2-Dichlorobenzene	0.5 U	--	--	--	--	10 U	1 U	1 U	1 U	1 U	1 U	--	0.5 U	--	--	--	10 U	1 U	1 U	1 U	1 U	1 U	1 U	--	
1,3-Dichlorobenzene	0.5 U	--	--	--	--	10 U	1 U	1 U	1 U	1 U	1 U	--	0.5 U	--	--	--	10 U	1 U	1 U	1 U	1 U	1 U	1 U	--	
1,4-Dichlorobenzene	0.2 J	--	--	--	--	10 U	1 U	1 U	1 U	1 U	1 U	--	0.22 J	--	--	--	10 U	1 U	1 U	1 U	1 U	1 U	1 U	--	
Chloroethane	0.5 U	5 U	5 U	5 UJ	5 UJ	10 U	1 R	1 U	1 U	1 U	1 U	--	0.5 U	5 U	5 U	5 U	10 U	1 R	1 U	1 U	1 U	1 U	1 U	--	
Tetrachloroethene	0.5 U	5 U	5 U	5 UJ	5 UJ	10 U	1 U	1 U	1 U	1 U	1 U	--	0.5 U	5 U	5 U	5 U	10 U	1 U	1 U	1 U	1 U	1 U	1 U	--	
1,1,1-Trichloroethane	0.5 U	5 U	5 U	5 UJ	5 UJ	10 U	1 U	1 U	1 U	1 U	1 U	--	0.5 U	5 U	5 U	5 U	10 U	1 U	1 U	1 U	1 U	1 U	1 U	--	
Trichloroethene	0.5 U	5 U	5 U	5 UJ	5 UJ	10 U	1 U	1 U	1 U	1 U	1 U	--	0.5 U	5 U	5 U	5 U	10 U	1 U	1 U	1 U	1 U	1 U	1 U	--	
Vinyl Chloride	0.5 U	5 U	5 U	5 UJ	5 UJ	10 U	1 U	1 U	1 U	1 U	1 U	--	0.5 U	5 U	5 U	5 U	10 U	1 U	1 U	1 U	1 U	1 U	1 U	--	
1,2,4-Trichlorobenzene	0.5 U	--	--	--	--	10 U	1 U	1 U	1 U	1 U	1 U	--	0.5 U	--	--	--	10 U	1 U	1 U	1 U	1 U	1 U	1 U	--	
cis-1,3-Dichloropropene	0.5 U	5 U	5 U	5 UJ	5 UJ	10 U	1 U	1 U	1 U	1 U	1 U	--	0.5 U	5 U	5 U	5 U	10 U	1 U	1 U	1 U	1 U	1 U	1 U	--	
Methylene Chloride	0.5 U	5 U	5 U	5 UJ	5 UJ	10 U	1 U	1 U	1 U	1 U	1 U	--	0.5 U	5 U	5 U	5 U	10 U	1 U	1 U	1 U	1 U	1 U	1 U	--	
Trichlorofluoromethane	0.5 U	--	--	--	--	10 U	1 U	1 U	1 U	1 U	1 U	--	0.5 U	--	--	--	10 U	1 U	1 U	1 U	1 U	1 U	1 U	--	
<b>Semi-Volatiles (µg/l)</b>																									
1,1-Biphenyl	5 U	5 U	5 U	5 UJ	5 UJ	5 U	5 U	5 UL	5 U	5 U	5 U	--	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	--
2,2'-oxybis (1-Chloropropane)	5 U	5 U	5 U	5 UJ	5 UJ	5 U	5 U	5 UL	5 U	5 U	5 U	--	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	--
2,4-Dimethylphenol	5 U	5 U	5 U	5 UJ	5 UJ	5 U	5 U	5 U	5 U	5 U	5 U	--	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	--
2,4-Dinitrophenol	20 U	20 U	20 J	20 UU	20 U	20 U	20 U	20 UL	20 U	20 U	20 U	--	20 U	20 U	20 U	20 U	20 U	20 U	20 U	20 U	20 U	20 U	20 U	20 U	--
2,6-Dinitrotoluene	5 U	5 U	5 U	5 UJ	5 UJ	5 U	5 U	5 U	5 U	5 U	5 U	--	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	--
2-Methylaphthalene	5 U	5 U	5 U	5 UJ	5 UJ	5 U	5 U	5 U	5 U	5 U	5 U	--	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	--
2-Methylphenol	5 U	5 U	5 U	5 UJ	5 UJ	5 U	5 U	5 U	5 U	5 U	5 U	--	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	--
4,6-Dinitro-2-methylphenol	20 U	20 U	20 U	20 U	20 U	20 U	20 U	20 U	20 U	20 U	20 U	--	20 U	20 U	20 U	20 U	20 U	20 U	20 U	20 U	20 U	20 U	20 U	20 U	--
4-Methylphenol	5 U	5 U	5 U	5 UJ	5 UJ	5 U	5 U	5 U	5 U	5 U	5 U	--	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	--
Acetophenone	5 U	5 U	5 U	5 UJ	5 UJ	5 U	5 U	5 U	5 U	5 U	5 U	--	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	--
Atrazine	5 UJ	5 U	5 U	5 UJ	5 UJ	5 U	5 U	5 UL	5 U	5 U	5 U	--	5 UJ	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	--
Benzaldehyde	5 UJ	5 U	5 U	5 UJ	5 UJ	5 U	5 U	5 UL	5 U	5 U	5 U	--	5 UJ	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	--
Benz (a) pyrene	5 U	5 U	5 U	5 UJ	5 UJ	5 U	5 U	5 U	5 U	5 U	5 U	--	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	--
Benz (b) Fluoranthene	5 U	5 U	5 U	5 UJ	5 UJ	5 U	5 U	5 U	5 U	5 U	5 U	--	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	--
Benz (g.h.i) Perylene	5 U	5 U	5 U	5 UJ	5 UJ	5 U	5 U	5 U	5 U	5 U	5 U	--	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	--
Benz (k) Fluoranthene	5 U	5 U	5 U	5 UJ	5 UJ	5 U	5 U	5 U	5 U	5 U	5 U	--	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	--
Bis(2-chloroethyl)Ether	1.8 J	0.04 B	0.081	0.02 UU	0.02 UL	5 U	5 U	5 U	5 U	5															

Table 3 (continued)

Summary of Surface-Water Quality Data for Army Creek and Army Pond

Parameter	SWA												SWB													
	10/04	1/05	4/05	7/05	10/05	1/06	4/06	7/06	10/06	1/07	4/07	10/09	10/04	1/05	4/05	7/05	10/05	1/06	4/06	7/06	10/06	1/07	4/07	10/09		
<b>Inorganics (µg/l)</b>																										
Aluminum	200 U	--	17 U	38.5 U	18.9 U	23.5 U	48.8 U	35.2 U	20.0 U	1100	11.1 U	200 U	200 U	--	26.8 U	44.6 U	14 U	16.6 U	46.3 U	66.1 U	20.0 U	30.3 U	29.6 U	200 U		
Antimony	2.9	--	3.8 U	5.2 U	1.6 U	1.5 U	1.1 U	1.8 U	1.4 J	1.7	2.1 U	60.0 U	2 U	--	3.8 U	3.7 U	1.6 U	1.2 U	1.1 U	1.8 U	1.2 U	1.7 U	2.1 U	60.0 U		
Arsenic	1.8 U	--	3 U	3.7 U	2 U	1.4 U	1.6 U	2.8 U	2.6 U	2.2 U	2.8 U	10.0 U	1.8 U	--	3 U	3.7 U	2 U	3.3	1.6 U	2.8 U	2.6 U	2.2 U	2.8 U	10.0 U		
Barium	38.8	--	44.7	53.9 J	66.1	33.7	52.7	62.4	62.8	37.3	53.1	39.5 J	29.5	--	26.3 B	55.5	47.9	49	57.2	42.4	44.5	47.4	21.8	36.9 J		
Beryllium	0.1 U	--	0.1 U	0.55 U	0.18 U	0.13 U	0.69 U	0.40 U	0.10 U	0.32 U	0.20 U	5.0 U	0.1 U	--	0.1 U	0.56 U	0.13 U	0.15 U	0.67 U	0.68 U	0.10 U	0.30 U	0.20 U	0.20 U		
Cadmium	0.2 U	--	0.4 U	0.5 U	0.2 U	0.20 U	0.40 U	0.20 U	0.20 U	0.40 U	0.5 U	0.2 U	--	0.4 U	0.5 U	0.2 U	0.20 U	0.20 U	0.40 U	0.20 U	0.20 U	0.40 U	0.5 U	0.20 U		
Calcium	41200	--	17900	16400 J	15400	10100	13800	18600	16400	9760	20700	14900	31200	--	17900	16200	14800	15200	12400	17100	15300	12900	20400	16200		
Chromium	0.5 U	--	2 U	1.1 UJ	0.6 U	0.40 U	0.60 U	0.50 U	0.73 U	1.9	0.30 U	10.0 U	0.5 U	--	1.2 U	1.1 U	0.6 U	0.40 U	0.60 U	0.50 U	0.45 U	0.60 U	0.37 U	10.0 U		
Cobalt	0.74	--	1.5 U	1.1 U	2.3	0.74	1.0	0.75	1.9 U	0.76 U	0.90 U	50.0 U	--	1.2 U	1.3	0.5 U	1.4	0.73	0.70 U	0.54 U	0.40 U	0.90 U	50.0 U			
Copper	0.5 U	--	1.1	1.2 J	1.5	2.5	1.5 U	1.9 J	4.3 U	4.1 U	1.9 U	25.0 U	0.5 U	--	1.2	0.8 U	1.1	0.65	0.67 U	1.5 U	3.5 U	2.9 U	2.2 U	25.0 U		
Dissolved Iron (mg/l)	0.024	0.846 L	0.387	0.331 J	0.0634	0.159	0.316	0.298	0.0763 U	1.31	0.0445 U	0.140	0.0697	46.9	0.479 K	0.484	0.0466	0.104	0.249	0.405	0.0688 U	0.118 U	0.262	0.386		
Lead	0.9 U	--	1.3	1.6 U	1.1 U	1.0 U	1.0 U	1.9 U	1.6 U	1.3	2.3 U	10.0 U	0.9 U	--	1.2 U	1.6 U	1.1	1.0 U	1.0 U	1.9 U	1.6 U	1.2 U	2.2 U	10.0 U		
Magnesium	2010	--	5780	4190 J	4690	3910	4750	5640	5450	3520	7750	4720 J	2100	--	5980	4530	4970	6000	4410	5080	5570	4580	8050	5100		
Dissolved Manganese (mg/l)	0.0057	0.271	0.273	0.030 J	0.0931	0.0871	0.167	0.111	0.123	0.0519	0.195	0.0862	0.0066	1.56	0.136	0.172	0.0209	0.104	0.189	0.0387	0.0546	0.0416	0.0294	0.100		
Mercury	0.2 U	--	0.1 U	0.1 U	0.1 U	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U	0.20 U	0.1 U	--	0.1 U	0.1 U	0.1 U	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U	0.20 U			
Nickel	0.5 U	--	3.6 U	2.3 J	2.5	1.6	2.5	1.1	2.2 U	2.9 U	1.9	40.0 U	0.5 U	--	3.1 U	2	2.5	1.5	1.9	1.3	2.1 U	1.6 U	1.7	40.0 U		
Potassium	4850	--	3580 J	4260 J	4460	2110	4120	4670	5080	3110	3530 J	3780 J	5110	--	3290 J	4390	4140	2980	3780	4530	3290	4290	2500 J	3520 J		
Selenium	2.7	--	2.5 U	4.5 U	4.3 U	3.3 U	1.8 U	2.2 U	2.5 U	2.1 U	2.7 U	35.0 U	2.6 U	--	1.7 U	4.5 U	4.3 U	3.3 UU	1.8 U	2.2 U	2.5 U	3.1	2.7 U	35.0 U		
Silver	0.7 U	--	1.4 U	1.3 U	0.2 U	0.50 U	0.30 U	0.65 U	0.40 U	1.2 U	10.0 U	0.7 U	--	1.4 U	1.3 U	0.2 U	0.50 U	0.50 U	0.30 U	0.50 U	0.40 U	1.2 U	10.0 U			
Sodium	18800	--	39900	28400 J	13900	16700	22700	20000	16200	8280	43700	20600	17500	--	40600	30900	15300	29500	20500	20200	16000	10800	47000	23700		
Thallium	1.9 U	--	3.2 U	4 U	4.5 U	5.5	2.1 U	5.2 U	3.2 U	4.2 U	3.3 U	25.0 U	1.9 U	--	2.9 U	4 U	4.5 U	3.9 U	2.1 U	3.6 U	3.2 U	3.4 U	2.9 U	25.0 U		
Vanadium	50 U	--	1 U	2 J	0.5 U	0.52	0.84	1.3	0.49 U	2.8 U	0.50 U	50.0 U	50 U	--	1.2 U	2.8	0.5 U	0.30 U	0.98 U	2.8	0.49 U	0.40 U	2.2 U	50.0 U		
Zinc	2.4	--	13.3 U	2.7 UJ	7.9	11.3	2.3	3.6 U	4.5	14.9 U	1.7 U	60.0 U	0.7 U	--	11 U	3.9 U	4.3	0.80 U	4.6 U	2.6	10.3 U	1.9 U	60.0 U			
<b>Pesticides/Herbicides (µg/l)</b>																										
4,4'-DDD	0.018 U	0.02 U	0.02 U	0.02 UJ	0.02 U	0.020 U	--	--	--	--	--	0.10 U	0.018 U	0.02 U	0.02 U	0.02 U	0.02 U	0.020 U	--	--	--	--	--	--	0.10 U	
4,4'-DDE	0.0091 U	0.02 U	0.02 U	0.02 U	0.02 U	0.0084 J	0.020 U	--	--	--	--	0.10 U	0.0091 U	0.02 U	0.02 U	0.013 J	0.012 J	0.020 U	--	--	--	--	--	--	0.10 U	
4,4'-DDT	0.0091 U	0.02 U	0.02 U	0.02 U	0.02 U	0.02 U	0.020 U	--	--	--	--	0.10 U	0.0091 U	0.02 U	0.02 U	0.02 U	0.02 U	0.020 U	--	--	--	--	--	--	0.10 U	
Aldrin	0.0091 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.010 U	--	--	--	--	0.029 J	0.0091 U	0.01 U	0.01 U	0.01 U	0.01 U	0.010 U	--	--	--	--	--	--	0.050 U	
alpha-BHC	0.0091 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.010 U	--	--	--	--	0.050 U	0.0091 U	0.01 U	0.01 U	0.01 U	0.01 U	0.010 U	--	--	--	--	--	--	0.050 U	
Alpha-Chlorodane	0.0091 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.010 U	--	--	--	--	0.050 U	0.0091 U	0.01 U	0.01 U	0.01 U	0.01 U	0.010 U	--	--	--	--	--	--	0.050 U	
beta-BHC	0.0091 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.010 U	--	--	--	--	0.050 U	0.0091 U	0.01 U	0.01 U	0.01 U	0.01 U	0.010 U	--	--	--	--	--	--	0.050 U	
delta-BHC	0.0091 U	0.01 U	0.01 U	0.01 U	0.0019 JN	0.01 U	0.010 U	--	--	--	--	0.050 U	0.0091 U	0.01 U	0.01 U	0.01 U	0.01 U	0.010 U	--	--	--	--	--	--	0.050 U	
Dielein	0.018 U	0.02 U	0.02 U	0.02 U	0.0039 J	0.020 U	--	--	--	--	--	0.10 U	0.018 U	0.0027 J	0.02 U	0.02 U	0.02 U	0.020 U	--	--	--	--	--	--	0.10 U	
Endosulfan I	0.0091 U	0.01 U	0.01 U	0.01 U	0.01 U	0.0038 J	--	--	--	--	--	0.050 U	0.0091 U	0.01 U	0.01 U	0.01 U	0.01 U	0.010 U	--	--	--	--	--	--	0.050 U	
Endosulfan II	0.018 U	0.02 U	0.02 U	0.02 U	0.02 U	0.02 U	0.020 U	--	--	--	--	0.10 U	0.018 U	0.02 U	0.02 U	0.02 U	0.02 U	0.020 U	--	--	--	--	--	--	0.10 U	
Endosulfan sulfate	0.018 U	0.02 U	0.02 U	0.02 U	0.0064 J	0.020 U	--	--	--	--	--	0.10 U	0.0042 J	0.02 U	0.02 U	0.02 U	0.02 U	0.020 U	--	--	--	--	--	--	0.10 U	
Endrin	0.018 U	0.02 U	0.02 U	0.02 U	0.02 U	0.02 U	0.020 U	--	--	--	--	0.10 U	0.018 U	0.02 U	0.02 U	0.02 U	0.02 U	0.020 U	--	--	--	--	--	--	0.10 U	
Endrin Aldehyde	0.0029 J	0.02 U	0.02 U	0.02 U	0.02 U	0.02 U	0.020 U	--	--	--	--	0.10 U	0.018 U	0.02 U	0.02 U	0.02 U	0.02 U	0.020 U	--	--	--	--	--	--	0.10 U	
Endrin Ketone	0.018 U	0.02 U	0.02 U	0.02 U	0.02 U	0.02 U	0.020 U	--	--	--	--	0.10 U	0.018 U	0.02 U	0.02 U	0.02 U	0.02 U	0.020 U	--	--	--	--	--	--	0.10 U	
gamma-BHC (Lindane)	0.0068 J	0.01 U	0.01 U	0.01 U	0.01 U	0.010 U	--	--	--	--	--	0.050 U	0.0091 U	0.01 U	0.01 U	0.01 U	0.01 U	0.010 U	--	--	--	--	--	--	0.050 U	
gamma-Chlorodane	0.0091 U	0.01 U	0.01 U	0.01 U	0.01 U	0.010 U	--	--	--	--	--	0.050 U	0.0091 U	0.01 U	0.01 U	0.01 U	0.01 U	0.010 U	--	--	--	--	--	--	0.050 U	
Heptachlor	0.0091 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.010 U	--	--	--	--	0.050 U	0.0091 U	0.01 U	0.01 U	0.01 U	0.01 U	0.010 U	--	--	--	--	--	--	0.050 U	
Heptachlor Epoxide	0.011 J	0.01 U	0.014 JN	0.008 J	0.01 U	0.010 U	--	--	--	--	--	0.050 U	0.0091 U	0.01 U	0.01 U	0.01 U	0.01 U	0.010 U	--	--	--	--	--	--	0.050 U	
Methoxychlor	0.091 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.10 U	--	--	--	--	0.050 U	0.091 U	0.1 U	0.1 U	0.1 U	0.1 U	0.0047 J	0.10 U	--	--	--	--	--	--	0.050 U
Toxaphene	--	--	--	--	1 U	1 U	1.0 U	--	--	--	--	5.0 U	--	--	--	1 U	1 U	1.0 U	--	--	--	--	--	--	5.0 U	

U - Analyte was not detected above the reporting limit.

J - Estimated concentration.

B - Analyte Detected in Method Blank

**Table 3 (continued)**  
Summary of Surface-Water Quality Data for Army Creek and Army Pond

Parameter	SWC												SWD												
	10/04	1/05	4/05	7/05	10/05	1/06	4/06	7/06	10/06	1/07	4/07	10/09	10/04	1/05	4/05	7/05	10/05	1/06	4/06	7/06	10/06	1/07	4/07	10/09	
<b>Non-Halogenated VOCs (µg/l)</b>																									
Benzene	0.5 U	5 U	5 U	5 U	5 UU	10 U	1 U	1 U	1 U	1 U	1 U	--	0.5 U	5 U	5 U	5 U	5 U	10 U	1 U	1 U	1 U	1 U	1 U	1 U	--
Toluene	0.5 U	5 U	5 U	5 U	5 U	10 U	1 U	1 U	1 U	1 U	1 U	--	0.5 U	5 U	5 U	5 U	5 U	10 U	1 U	1 U	1 U	1 U	1 U	1 U	--
Ethylbenzene	0.5 U	5 U	5 U	5 U	5 U	10 U	1 U	1 U	1 U	1 U	1 U	--	0.5 U	5 U	5 U	5 U	5 U	10 U	1 U	1 U	1 U	1 U	1 U	1 U	--
Xylene (total)	0.5 U	5 U	5 U	5 U	5 U	10 U	3 U	3 U	3 U	3 U	3 U	--	0.5 U	5 U	5 U	5 U	5 U	10 U	3 U	3 U	3 U	3 U	3 U	3 U	--
2-Butanone	5 U	10 U	10 R	10 R	10 U	10 U	5 U	5 U	5 U	5 U	5 U	--	5 U	10 U	10 R	10 R	10 U	10 U	5 U	5 U	5 U	5 U	5 U	5 U	--
Acetone	5 U	10 J	20 R	20 R	10 R	10 U	5 UU	10 U	5 U	5 UJ	6.8 U	--	5 U	20 R	20 R	20 R	20 R	10 U	5 UJ	9.7 U	5 U	5 UJ	5 U	5 U	--
Carbon Disulfide	0.5 U	5 U	5 U	5 U	5 U	10 U	1 U	1 U	1 U	1 U	1 U	--	0.5 U	5 U	5 U	5 U	5 U	10 U	1 U	1 U	1 U	1 U	1 U	1 U	--
Cyclohexane	0.5 U	--	--	--	--	10 U	1 U	1 U	1 U	1 U	1 U	--	0.5 U	--	--	--	--	10 U	1 U	1 U	1 U	1 U	1 U	1 U	--
Isopropylbenzene	0.5 U	--	--	--	--	10 U	1 U	1 U	1 U	1 U	1 U	--	0.5 U	--	--	--	--	10 U	1 U	1 U	1 U	1 U	1 U	1 U	--
Methyl-tert-butyl ether	0.27 J	--	--	--	--	10 U	1 U	1 U	1 U	1 U	1 U	--	0.44 J	--	--	--	--	10 U	1 U	1 U	1 U	1 U	1 U	1 U	--
Methylcyclohexane	0.5 U	--	--	--	--	10 U	1 U	1 U	1 U	1 U	1 U	--	0.5 U	--	--	--	--	10 U	1 U	1 U	1 U	1 U	1 U	1 U	--
4-Methyl-2-pentanone	5 U	10 U	10 U	10 U	10 U	10 U	5 U	5 U	5 U	5 U	5 U	--	5 U	10 U	10 U	10 U	10 U	10 U	5 U	5 U	5 U	5 U	5 U	5 U	--
<b>Halogenated VOCs (µg/l)</b>																									
Bromoform	0.5 U	5 U	5 U	5 U	5 UU	10 UJ	1 U	1 U	1 U	1 U	1 U	--	0.5 U	5 U	5 U	5 U	5 U	10 UU	1 U	1 U	1 U	1 U	1 U	1 U	--
Bromodichloromethane	0.5 U	5 U	5 U	5 U	5 UJ	10 U	1 U	1 U	1 U	1 U	1 U	--	0.5 U	5 U	5 U	5 U	5 U	10 U	1 U	1 U	1 U	1 U	1 U	1 U	--
Carbon Tetrachloride	0.5 U	5 U	5 U	5 U	5 U	10 U	1 U	1 U	1 U	1 U	1 U	--	0.5 U	5 U	5 U	5 U	5 U	10 U	1 U	1 U	1 U	1 U	1 U	1 U	--
Chlorobenzene	0.5 U	5 U	5 U	5 U	5 U	10 U	1 U	1 U	1 U	1 U	1 U	--	0.5 U	5 U	5 U	5 U	5 U	10 U	1 U	1 U	1 U	1 U	1 U	1 U	--
Chloroform	0.5 U	5 U	5 U	5 U	5 U	10 U	1 U	1 U	1 U	1 U	1 U	--	0.5 U	5 U	5 U	5 U	5 U	10 U	1 U	1 U	1 U	1 U	1 U	1 U	--
Dibromochloromethane	0.5 U	5 U	5 U	5 U	5 U	10 U	1 U	1 U	1 U	1 U	1 U	--	0.5 U	5 U	5 U	5 U	5 U	10 U	1 U	1 U	1 U	1 U	1 U	1 U	--
1,2-Dichloroethane	0.5 U	5 U	5 U	5 U	5 U	10 U	1 U	1 U	1 U	1 U	1 U	--	0.5 U	5 U	5 U	5 U	5 U	10 U	1 U	1 U	1 U	1 U	1 U	1 U	--
1,1-Dichloroethane	0.5 U	5 U	5 U	5 U	5 U	10 U	1 U	1 U	1 U	1 U	1 U	--	0.5 U	5 U	5 U	5 U	5 U	10 U	1 U	1 U	1 U	1 U	1 U	1 U	--
cis-1,2-Dichloroethene	0.5 U	5 U	5 U	5 U	5 U	10 U	1 U	1 U	1 U	1 U	1 U	--	0.5 U	5 U	5 U	5 U	5 U	10 U	1 U	1 U	1 U	1 U	1 U	1 U	--
trans-1,2-Dichloroethene	0.5 U	5 U	5 U	5 U	5 U	10 U	1 U	1 U	1 U	1 U	1 U	--	0.5 U	5 U	5 U	5 U	5 U	10 U	1 U	1 U	1 U	1 U	1 U	1 U	--
1,1-Dichloroethene	0.5 U	5 U	5 U	5 U	5 U	10 U	1 U	1 U	1 U	1 U	1 U	--	0.5 U	5 U	5 U	5 U	5 U	10 U	1 U	1 U	1 U	1 U	1 U	1 U	--
1,2-Dichlorobenzene	0.5 U	--	--	--	--	10 U	1 U	1 U	1 U	1 U	1 U	--	0.5 U	--	--	--	--	10 U	1 U	1 U	1 U	1 U	1 U	1 U	--
1,3-Dichlorobenzene	0.5 U	--	--	--	--	10 U	1 U	1 U	1 U	1 U	1 U	--	0.5 U	--	--	--	--	10 U	1 U	1 U	1 U	1 U	1 U	1 U	--
1,4-Dichlorobenzene	0.11 J	--	--	--	--	10 U	1 U	1 U	1 U	1 U	1 U	--	0.5 U	--	--	--	--	10 U	1 U	1 U	1 U	1 U	1 U	1 U	--
Chloroethane	0.5 U	5 U	5 U	5 U	5 UU	10 U	1 R	1 U	1 U	1 U	1 U	--	0.5 U	5 U	5 U	5 U	5 U	10 U	1 R	1 U	1 U	1 U	1 U	1 U	--
Tetrachloroethene	0.5 U	5 U	5 U	5 U	5 U	10 U	1 U	1 U	1 U	1 U	1 U	--	0.5 U	5 U	5 U	5 U	5 U	10 U	1 U	1 U	1 U	1 U	1 U	1 U	--
1,1,1-Trichloroethane	0.5 U	5 U	5 U	5 U	5 U	10 U	1 U	1 U	1 U	1 U	1 U	--	0.5 U	5 U	5 U	5 U	5 U	10 U	1 U	1 U	1 U	1 U	1 U	1 U	--
Trichloroethene	0.5 U	5 U	5 U	5 U	5 U	10 U	1 U	1 U	1 U	1 U	1 U	--	0.5 U	5 U	5 U	5 U	5 U	10 U	1 U	1 U	1 U	1 U	1 U	1 U	--
Vinyl Chloride	0.5 U	5 U	5 U	5 U	5 UU	10 U	1 U	1 U	1 U	1 U	1 U	--	0.5 U	5 U	5 U	5 U	5 U	10 U	1 U	1 U	1 U	1 U	1 U	1 U	--
1,2,4-Trichlorobenzene	0.5 U	--	--	--	--	10 U	1 U	1 U	1 U	1 U	1 U	--	0.5 U	--	--	--	--	10 U	1 U	1 U	1 U	1 U	1 U	1 U	--
cis-1,3-Dichloropropene	0.5 U	5 U	5 U	5 U	5 UU	10 U	1 U	1 U	1 U	1 U	1 U	--	0.5 U	5 U	5 U	5 U	5 U	10 U	1 U	1 U	1 U	1 U	1 U	1 U	--
Methylene Chloride	0.5 U	5 U	5 U	5 U	5 UU	10 U	1 U	1 U	1 U	1 U	1 U	--	0.5 U	5 U	5 U	5 U	5 U	10 U	1 U	1 U	1 U	1 U	1 U	1 U	--
Trichlorofluoromethane	0.5 U	--	--	--	--	10 U	1 U	1 U	1 U	1 U	1 U	--	0.5 U	--	--	--	--	10 U	1 U	1 U	1 U	1 U	1 U	1 U	--
<b>Semi-Volatiles (µg/l)</b>																									
1,1-Biphenyl	5 U	5 U	5.1 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	--	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	--
2,2'-oxybis (1-Chloropropane)	5 UJ	5 U	5.1 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	--	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	--
2,4-Dimethylphenol	5 U	5 U	5.1 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	--	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	--
2,4-Dinitrophenol	20 U	20 U	21 UJ	20 U	20 U	20 U	20 U	20 U	20 U	20 U	20 U	--	20 U	20 U	20 U	20 U	20 U	20 U	20 U	20 U	20 U	20 U	20 U	20 U	--
2,6-Dinitrotoluene	5 UJ	5 U	5.1 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	--	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	--
2-Methylaphthalene	5 U	5 U	5.1 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	--	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	--
2-Methylphenol	5 U	5 U	5.1 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	--	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	--
4,6-Dinitro-2-methylphenol	20 U	20 U	20 U	20 U	20 U	20 U	20 U	20 U	20 U	20 U	20 U	--	20 U	20 U	20 U	20 U	20 U	20 U	20 U	20 U	20 U	20 U	20 U	20 U	--
4-Methylphenol	5 U	5 U	5.1 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	--	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	--
Acetophenone	5 U	5 U	5.1 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	--	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	--
Atrazine	5 U	5 U	5.1 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	--	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	--
Benzaldehyde	5 UJ	5 U	5.1 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	--	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	--
Benz (a) pyrene	5 U	5 U	5.1 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	--	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	--
Benz (b) Fluoranthene	5 U	5 U	5.1 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	--	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	--
Benz (g,h,i) Perylene	5 U	5 U	5.1 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	--	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	--
Benz (k) Fluoranthene	5 U	5 U	5.1 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	--	5 U	5 U	5 U	5 U	5 U								

Table 3 (continued)

Summary of Surface-Water Quality Data for Army Creek and Army Pond

Parameter	SWC												SWD													
	10/04	1/05	4/05	7/05	10/05	1/06	4/06	7/06	10/06	1/07	4/07	10/09	10/04	1/05	4/05	7/05	10/05	1/06	4/06	7/06	10/06	1/07	4/07	10/09		
<b>Inorganics (µg/l)</b>																										
Aluminum	4.4 U	--	38.1 U	53.6 U	15.1 U	54.6	43.2 U	48.2 U	20.0 U	30.3 U	102 U	200 U	200 U	--	112 U	13.5 UJ	22.7 U	42.2 U	62.6 U	27.0 U	20.0 U	30.3 U	11.1 U	200 U		
Antimony	2 U	--	3.8 U	3.7 U	1.6 U	1.2 U	1.1 U	1.8 U	1.2 U	1.7 U	2.1 U	60.0 U	2 U	--	32.7	3.7 UJ	1.6 U	1.2 U	1.1 U	1.8 U	1.4 J	1.7 U	2.1 I	60.0 U		
Arsenic	1.8 U	--	3 U	3.7 U	2 U	1.4 U	1.6 U	2.8 U	2.6 U	2.2 U	2.8 U	10.0 U	1.8 U	--	7.1	3.7 UJ	2 U	1.4 U	1.6 U	2.8 U	2.6 U	2.2 U	2.8 U	10.0 U		
Barium	66.2	--	4.7	52.5	21.5	21.7	40.8	45.0	50.8	22.6	7.6	34.2 J	66.1	--	172	65.7 J	65.7	47.1	40.4	63.9	56.1	33.2	76.5	72.8 J		
Beryllium	0.1 U	--	0.1 U	0.61 U	0.11 U	0.17 U	0.70 U	0.40 U	0.10 U	0.30 U	0.20 U	5.0 U	0.1 U	--	2.7 U	0.6 UJ	0.13 U	0.18 U	0.74 U	0.54 U	0.10 U	0.30 U	0.20 U	0.5 U		
Cadmium	0.2 U	--	0.4 U	0.5 U	0.2 U	0.20 U	0.20 U	0.40 U	0.20 U	0.20 U	0.40 U	5.0 U	0.2 U	--	2.5 U	0.5 UJ	0.2 U	0.20 U	0.20 U	0.40 U	0.20 U	0.20 U	0.40 U	5.0 U		
Calcium	19100	--	14500	15800	5820	5220	9830	16800	16300	6210	25800	16700	19500	--	21000	19200 J	16900	11300	12800	19900	18300	11800	22700	26500		
Chromium	0.5 U	--	1.2 U	1.1 U	0.6 U	0.40 U	0.60 U	0.50 U	0.42 U	0.60 U	0.30 U	10.0 U	0.5 U	--	7.7 U	1.1 UJ	0.6 U	0.40 U	0.64	0.50 U	0.52 U	0.60 U	0.30 U	10.0 U		
Cobalt	50 U	--	1.1 U	1.1 U	0.5 U	0.62	0.88	0.70 U	0.93 U	1.6 U	1.1 U	50.0 U	50 U	--	27.1	1.1 UJ	0.5 U	0.50 U	0.40 U	1.5	0.96 U	0.40 U	0.90 U	50.0 U		
Copper	0.5 U	--	0.9 U	0.8 U	0.6 U	1.6	0.40 U	1.5 U	3.2 U	0.86 U	3.8 U	25.0 U	0.5 U	--	13	0.8 UJ	2.5	1.3	2.4 U	1.5 U	3.7 U	2.8 U	1.4 U	25.0 U		
Dissolved Iron (mg/l)	0.226	0.322	0.363	0.499	0.0345	0.112	0.487	0.385	0.0618 U	0.537	0.760	0.188	1.17	10.1	0.422	0.743 J	0.0371	0.0952 U	0.338	0.0413 U	0.730	0.396	0.403	0.787		
Lead	0.9 U	--	1.2 U	1.6 U	1.1 U	1.0 U	1.0 U	1.9 U	1.6 U	1.2 U	2 U	10.0 U	0.9 U	--	2.3	1.6 UJ	1.1 U	1.0 U	1.9 U	1.6 U	1.2 U	1.0 U	1.0 U	10.0 U		
Magnesium	7080	--	4810	4550 J	4080	2940	4910	5550	6090	3390	8430	5280	7390	--	8440	241 J	5960	5100	4510	7390	7180	4420	9200	10800		
Dissolved Manganese (mg/l)	0.508	0.416	0.0347	0.0435	0.0269	0.0713	0.214	0.0551	0.0999	0.0553	0.0723	0.0325	0.368	1.99	0.352	7.15 J	0.0158	0.0244	0.0850	0.217	0.209	0.0745	0.243	0.382		
Mercury	0.1 U	--	0.1 U	0.1 U	0.1 U	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U	0.2 U	0.2 U	--	0.1 U	0.1 UJ	0.1 U	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U	0.20 U		
Nickel	0.5 U	--	2.7 U	1.8	3.9	1.2	2.2	1.4	2.3 U	2.4 U	3.8	40.0 U	0.68	--	25.1 U	2.2 J	2.7	2	2.1	1.3	2.1 U	1.7 U	2.2	40.0 U		
Potassium	3620	--	2480 J	4210 J	1830	1340	1980	4590	3350	1270	2410 J	3400 J	3440	--	3860 J	4790 J	4290	4110	3460	4670	3770	2720	2920 J	4870 J		
Selenium	2.6 U	--	1.7 U	4.5 U	4.3 U	3.3 U	1.8 U	2.2 U	2.5 U	2.1 U	2.7 U	35.0 U	2.6 U	--	4.4 U	4.5 UJ	4.3 U	3.3 U	1.8 U	2.2 U	2.5 U	2.1 U	2.7 U	35.0 U		
Silver	0.7 U	--	1.4 U	1.3 U	0.2 U	0.50 U	0.50 U	0.30 U	0.51 U	0.40 U	1.2 U	10.0 U	0.7 U	--	5.1	1.3 UJ	0.2 U	0.50 U	0.50 U	0.30 U	0.50 U	0.40 U	1.2 U	10.0 U		
Sodium	25400	--	33400	32300	2880	6400	7720	21900	17900	2580	49000	24400	28600	--	49400	41500 J	15400	7090	20100	28600	23000	12600	53100	66300		
Thallium	1.9 U	--	2.9 U	4 U	4.5 U	3.9 U	2.1 U	3.6 U	3.2 U	3.4 U	2.9 U	25.0 U	1.9 U	--	6.4 U	4 UJ	4.5 U	4	2.1 U	3.6 U	3.2 U	3.4 U	2.9 U	25.0 U		
Vanadium	50 U	--	1.7 U	2.7	0.5 U	0.53	0.40 U	2.1	0.46 U	0.40 U	4.2	50.0 U	50 U	--	25.8	0.8 UJ	0.5 U	0.30 U	0.62 U	0.30 U	0.40 U	0.46 U	0.50 U	50.0 U		
Zinc	5.1	--	34.7	2.8 U	4	7.3	0.80 U	4.8 U	3.3	8.4 U	2.3 U	60.0 U	7.6	--	22.3 U	10.3 UJ	29.3	11.4	10.2	8.3 U	6.7	11.9 U	10.7	60.0 U		
<b>Pesticides/Herbicides (µg/l)</b>																										
4,4'-DDD	0.02 UJ	0.002 J	0.02 U	0.02 U	0.02 U	0.02 U	0.020 U	--	--	--	--	0.10 U	0.02 UJ	0.026	0.02 U	0.02 UJ	0.02 U	0.020 U	--	--	--	--	--	--	0.10 U	
4,4'-DDE	0.02 UJ	0.0039 J	0.02 U	0.015 J	0.0047 J	0.020 U	--	--	--	--	--	0.10 U	0.02 UJ	0.036	0.02 U	0.02 UJ	0.0075 J	0.020 U	--	--	--	--	--	--	0.10 U	
4,4'-DDT	0.02 UJ	0.02 U	0.02 U	0.02 U	0.02 U	0.02 U	0.020 U	--	--	--	--	0.10 U	0.02 UJ	0.022	0.02 U	0.02 UJ	0.02 U	0.020 U	--	--	--	--	--	--	0.10 U	
Aldrin	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.010 U	--	--	--	--	0.050 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.010 U	--	--	--	--	--	--	0.050 U	
alpha-BHC	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.010 U	--	--	--	--	0.050 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.010 U	--	--	--	--	--	--	0.050 U	
Alpha-Chlorodane	0.01 UJ	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.010 U	--	--	--	--	0.050 U	0.01 UJ	0.046 JN	0.01 U	0.01 U	0.01 U	0.010 U	--	--	--	--	--	--	0.050 U	
beta-BHC	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.010 U	--	--	--	--	0.050 U	0.01 U	0.01 U	0.01 U	0.01 U	0.024 JN	0.01 U	0.010 U	--	--	--	--	--	0.050 U	
delta-BHC	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.010 U	--	--	--	--	0.050 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.010 U	--	--	--	--	--	--	0.050 U	
Dielein	0.02 UJ	0.0025 J	0.02 U	0.02 U	0.02 U	0.02 U	0.020 U	--	--	--	--	0.10 U	0.02 UJ	0.02 U	0.02 U	0.0044 J	0.02 UJ	0.02 U	0.020 U	--	--	--	--	--	0.10 U	
Endosulfan I	0.01 UJ	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.010 U	--	--	--	--	0.050 U	0.01 UJ	0.01 U	0.01 U	0.01 U	0.01 U	0.010 U	--	--	--	--	--	--	0.050 U	
Endosulfan II	0.02 UJ	0.02 U	0.02 U	0.02 U	0.02 U	0.02 U	0.020 U	--	--	--	--	0.10 U	0.02 UJ	0.02 U	0.02 U	0.02 U	0.02 U	0.020 U	--	--	--	--	--	--	0.050 U	
Endosulfan sulfate	0.02 UJ	0.0016 J	0.02 U	0.02 U	0.02 U	0.02 U	0.020 U	--	--	--	--	0.10 U	0.02 UJ	0.03	0.02 U	0.02 UJ	0.02 U	0.020 U	--	--	--	--	--	--	0.050 U	
Endrin	0.02 UJ	0.02 U	0.02 U	0.02 U	0.02 U	0.02 U	0.020 U	--	--	--	--	0.10 U	0.02 UJ	0.02 U	0.02 U	0.02 UJ	0.02 U	0.020 U	--	--	--	--	--	--	0.050 U	
Endrin Aldehyde	0.02 UJ	0.02 U	0.02 U	0.02 U	0.02 U	0.02 U	0.020 U	--	--	--	--	0.10 U	0.02 UJ	0.02 U	0.02 U	0.02 UJ	0.02 U	0.020 U	--	--	--	--	--	--	0.050 U	
Endrin Ketone	0.02 UJ	0.02 U	0.02 U	0.02 U	0.02 U	0.02 U	0.020 U	--	--	--	--	0.10 U	0.02 UJ	0.02 U	0.02 U	0.02 UJ	0.02 U	0.020 U	--	--	--	--	--	--	0.050 U	
gamma-BHC (Lindane)	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.010 U	--	--	--	--	0.050 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.010 U	--	--	--	--	--	--	0.050 U	
gamma-Chlorodane	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.010 U	--	--	--	--	0.050 U	0.01 U	0.01 J	0.01 J	0.01 U	0.01 J	0.01 U	0.010 U	--	--	--	--	--	--	0.050 U
Heptachlor	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.010 U	--	--	--	--	0.050 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.010 U	--	--	--	--	--	--	0.050 U	
Heptachlor Epoxide	0.01 U	0.01 U	0.0022 J	0.012 JN	0.01 U	0.01 U	0.010 U	--	--	--	--	0.050 U	0.01 U	0.01 J	0.01 J	0.01 U	0.061 J	0.01 U	0.010 U	--	--	--	--	--	--	0.050 U
Methoxychlor	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.10 U	--	--	--	--	0.050 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.10 U	--	--	--	--	--	--	0.050 U	
Toxaphene	--	--	--	--	1 U	1 U	1.0 U	--	--	--	--	5.0 U	--	--	--	1 U	1 U	1.0 U	--	--	--	--	--	--	5.0 U	

U - Analyte was not detected above the reporting limit.

**Table 3 (continued)**

**Summary of Surface-Water Quality Data for Army Creek and Army Pond**

Parameter	SWE												SWF												
	10/04	1/05	4/05	7/05	10/05	1/06	4/06	7/06	10/06	1/07	4/07	10/09	10/04	1/05	4/05	7/05	10/05	1/06	4/06	7/06	10/06	1/07	4/07	10/09	
<b>Non-Halogenated VOCs (µg/l)</b>																									
Benzene	0.5 U	5 U	5 U	5 U	5 UJ	10 U	1 U	1 U	1 U	1 U	1 U	--	0.14 J	5 U	5 U	5 U	5 UJ	10 U	1 U	1 U	1 U	1 U	1 U	--	
Toluene	0.5 U	5 U	5 U	5 U	5 UJ	10 U	1 U	1 U	1 U	1 U	1 U	--	0.5 U	5 U	5 U	5 U	5 UJ	10 U	1 U	1 U	1 U	1 U	1 U	--	
Ethylbenzene	0.5 U	5 U	5 U	5 U	5 UJ	10 U	1 U	1 U	1 U	1 U	1 U	--	0.5 U	5 U	5 U	5 U	5 UJ	10 U	1 U	1 U	1 U	1 U	1 U	--	
Xylene (total)	0.5 U	5 U	5 U	5 U	5 UJ	10 U	3 U	3 U	3 U	3 U	3 U	--	0.5 U	5 U	5 U	5 U	5 UJ	10 U	3 U	3 U	3 U	3 U	3 U	--	
2-Butanone	5 U	10 U	10 R	10 R	10 UJ	10 U	5 U	5 U	5 U	5 U	5 U	--	5 U	10 U	10 R	10 R	10 U	10 U	5 U	5 U	5 U	5 U	5 U	--	
Acetone	5 U	20 R	20 R	20 R	20 R	1.6 J	5 UU	8.4 U	5 U	5 U	5 U	--	5 U	20 R	20 R	20 R	20 R	10 U	5 UJ	6.0 U	5 U	5 UJ	5 U	5 U	--
Carbon Disulfide	0.5 U	5 U	5 U	5 U	5 UJ	10 U	1 U	1 U	1 U	1 U	1 U	--	0.5 U	5 U	5 U	5 U	5 UJ	10 U	1 U	1 U	1 U	1 U	1 U	--	
Cyclohexane	0.5 U	--	--	--	--	10 U	1 U	1 U	1 U	1 U	1 U	--	0.5 U	--	--	--	--	10 U	1 U	1 U	1 U	1 U	1 U	--	
Isopropylbenzene	0.5 U	--	--	--	--	10 U	0.57 J	1 U	1 U	1 U	1 U	--	0.5 U	--	--	--	--	10 U	0.42 J	1 U	1 U	1 U	1 U	--	
Methyl-tert-butyl ether	0.34 J	--	--	--	--	10 U	1 U	1 U	1 U	1 U	1 U	--	0.5 U	--	--	--	--	10 U	1 U	1 U	1 U	1 U	1 U	--	
Methylcyclohexane	0.5 U	--	--	--	--	10 U	1 U	1 U	1 U	1 U	1 U	--	0.5 U	--	--	--	--	10 U	1 U	1 U	1 U	1 U	1 U	--	
4-Methyl-2-pentanone	5 U	10 U	10 U	10 U	10 UJ	10 U	5 U	5 U	5 U	5 U	5 U	--	5 U	10 U	10 U	10 U	10 U	5 U	5 U	5 U	5 U	5 U	5 U	--	
<b>Halogenated VOCs (µg/l)</b>																									
Bromform	0.5 U	5 U	5 U	5 U	5 UJ	10 U	1 U	1 U	1 U	1 U	1 U	--	0.5 U	5 U	5 U	5 U	5 UJ	10 U	1 U	1 U	1 U	1 U	1 U	--	
Bromodichloromethane	0.5 U	5 U	5 U	5 U	5 UJ	10 U	1 U	1 U	1 U	1 U	1 U	--	0.5 U	5 U	5 U	5 U	5 UJ	10 U	1 U	1 U	1 U	1 U	1 U	--	
Carbon Tetrachloride	0.5 U	5 UU	5 U	5 U	5 UJ	10 U	1 U	1 U	1 U	1 U	1 U	--	0.5 U	5 U	5 U	5 U	5 UJ	10 U	1 U	1 U	1 U	1 U	1 U	--	
Chlorobenzene	0.5 U	5 U	5 U	5 U	5 UJ	10 U	1 U	1 U	1 U	1 U	1 U	--	0.5 U	5 U	5 U	5 U	5 UJ	10 U	1 U	1 U	1 U	1 U	1 U	--	
Chloroform	0.5 U	5 U	5 U	5 U	5 UJ	10 U	1 U	1 U	1 U	1 U	1 U	--	0.5 U	5 U	5 U	5 U	5 UJ	10 U	1 U	1 U	1 U	1 U	1 U	--	
Dibromochloromethane	0.5 U	5 U	5 U	5 U	5 UJ	10 U	1 U	1 U	1 U	1 U	1 U	--	0.5 U	5 U	5 U	5 U	5 UJ	10 U	1 U	1 U	1 U	1 U	1 U	--	
1,2-Dichloroethane	0.5 U	5 U	5 U	5 U	5 UJ	10 U	1 U	1 U	1 U	1 U	1 U	--	0.5 U	5 U	5 U	5 U	5 UJ	10 U	1 U	1 U	1 U	1 U	1 U	--	
1,1-Dichloroethane	0.5 U	5 U	5 U	5 U	5 UJ	10 U	1 U	1 U	1 U	1 U	1 U	--	0.5 U	5 U	5 U	5 U	5 UJ	10 U	1 U	1 U	1 U	1 U	1 U	--	
cis-1,2-Dichloroethylene	0.5 U	5 U	5 U	5 U	5 UJ	10 U	1 U	1 U	1 U	1 U	1 U	--	0.5 U	5 U	5 U	5 U	5 UJ	10 U	1 U	1 U	1 U	1 U	1 U	--	
trans-1,2-Dichloroethylene	0.5 U	5 U	5 U	5 U	5 UJ	10 U	1 U	1 U	1 U	1 U	1 U	--	0.5 U	5 U	5 U	5 U	5 UJ	10 U	1 U	1 U	1 U	1 U	1 U	--	
1,1-Dichloroethene	0.5 U	5 U	5 U	5 U	5 UJ	10 U	1 U	1 U	1 U	1 U	1 U	--	0.5 U	5 U	5 U	5 U	5 UJ	10 U	1 U	1 U	1 U	1 U	1 U	--	
1,2-Dichlorobenzene	0.5 U	--	--	--	--	10 U	1 U	1 U	1 U	1 U	1 U	--	0.5 U	--	--	--	--	10 U	1 U	1 U	1 U	1 U	1 U	--	
1,3-Dichlorobenzene	0.5 U	--	--	--	--	10 U	1 U	1 U	1 U	1 U	1 U	--	0.5 U	--	--	--	--	10 U	1 U	1 U	1 U	1 U	1 U	--	
1,4-Dichlorobenzene	0.5 U	--	--	--	--	10 U	1 U	1 U	1 U	1 U	1 U	--	0.5 U	--	--	--	--	10 U	1 U	1 U	1 U	1 U	1 U	--	
Chloroethane	0.5 U	5 U	5 U	5 U	5 UJ	10 U	1 R	1 U	1 U	1 U	1 U	--	0.5 U	5 U	5 U	5 U	5 UJ	10 U	1 R	1 U	1 U	1 U	1 U	--	
Tetrachloroethylene	0.5 U	5 U	5 U	5 U	5 UJ	10 U	1 U	1 U	1 U	1 U	1 U	--	0.5 U	5 U	5 U	5 U	5 UJ	10 U	1 U	1 U	1 U	1 U	1 U	--	
1,1,1-Trichloroethane	0.5 U	5 U	5 U	5 U	5 UJ	10 U	1 U	1 U	1 U	1 U	1 U	--	0.5 U	5 U	5 U	5 U	5 UJ	10 U	1 U	1 U	1 U	1 U	1 U	--	
Trichloroethene	0.5 U	5 U	5 U	5 U	5 UJ	10 U	1 U	1 U	1 U	1 U	1 U	--	0.5 U	5 U	5 U	5 U	5 UJ	10 U	1 U	1 U	1 U	1 U	1 U	--	
Vinyl Chloride	0.5 U	5 U	5 U	5 U	5 UJ	10 U	1 U	1 U	1 U	1 U	1 U	--	0.5 U	5 U	5 U	5 U	5 UJ	10 U	1 U	1 U	1 U	1 U	1 U	--	
1,2,4-Trichlorobenzene	0.5 U	--	--	--	--	10 U	1 U	1 U	1 U	1 U	1 U	--	0.5 U	--	--	--	--	10 U	1 U	1 U	1 U	1 U	1 U	--	
cis-1,3-Dichloropropene	0.5 U	5 U	5 U	5 U	5 UJ	10 U	1 U	1 U	1 U	1 U	1 U	--	0.5 U	5 U	5 U	5 U	5 UJ	10 U	1 U	1 U	1 U	1 U	1 U	--	
Methylene Chloride	0.5 U	5 U	5 U	5 U	5 UJ	10 U	1 U	1 UJ	1 U	1 U	1 U	--	0.5 U	5 U	5 U	5 U	5 UJ	10 U	1 U	1 UJ	1 U	1 U	1 U	--	
Trichlorofluoromethane	0.5 U	--	--	--	--	10 U	1 UJ	1 U	1 U	1 U	1 U	--	0.5 U	--	--	--	--	10 U	1 UJ	1 U	1 U	1 U	1 U	--	
<b>Semi-Volatiles (µg/l)</b>																									
1,1-Biphenyl	5 U	5 UL	5 U	5.3 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	--	5 U	5 UL	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	--
2,2'-oxybis(1-Chloropropane)	5 U	5 U	5 U	5.3 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	--	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	--
2,4-Dimethylphenol	5 U	5 U	5 U	5.3 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	--	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	--
2,4-Dinitrophenol	20 U	20 U	20 UJ	21 U	20 U	20 U	20 UL	20 U	20 UL	20 U	20 U	--	20 U	20 U	20 U	20 U	20 UJ	20 U	20 U	20 U	20 U	20 U	20 U	--	
2,6-Dinitrotoluene	5 UU	5 U	5 U	5.3 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	--	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	--
2-Methylnaphthalene	5 U	5 U	5 U	5.3 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	--	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	--
2-Methylphenol	5 U	5 U	5 U	5.3 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	--	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	--
4,6-Dinitro-2-methylphenol	20 U	20 U	20 U	21 U	20 U	20 U	20 U	20 U	20 U	20 U	20 U	--	20 U	20 U	20 U	20 U	20 UJ	20 U	20 U	20 U	20 U	20 U	20 U	--	
4-Ethylphenol	5 U	5 U	5 U	5.3 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	--	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	--
Acetophenone	5 U	5 U	5 U	5.3 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	--	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	--
Atrazine	5 U	5 U	5 U	5.3 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	--	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	--
Benzaldehyde	5 UU	5 U	5 U	5.3 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	--	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	--
Benz(o,a) Pyrene	5 UU	5 U	5 U	5.3 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	--	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	--
Benz(o,b) Fluoranthene	5 UU	5 U	5 U	5.3 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	--	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	--
Benz(o,g,h,i) Perylene	5 UU	5 U	5 U	5.3 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	--	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	--
Bis(2-chloroethyl)Ether	0.021	0.025	0.043	0.021 UU	0.02 UJ	5 U	5 U	5 U	5 U	5 U	5 U	--	0.019 U	0.69	0.037	0.02 UJ	0.02 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	--
Bis(2-ethylhexyl)phthalate	5 U	48	4.6 J	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	--	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	--
Caprolactam	5 UU	5 U	5 U	5.3 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	--	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	--
Di-n-butyl phthalate	5 U	5 U	5 U	5.3 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	--	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	--
Di-n-octyl phthalate	5 U	5 U	5 U	5.3 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	--	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	--
Dibenzo(a,h) Anthracene	5 UU	5 U	5 U	5.3 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	--	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	--
Diethylphthalate	5 U	5 U	5 U	5.3 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	--	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	--
Hexachlorocyclopentadiene	5 U	5 U	5 U	5.3 U	5 U	5 U	5 U	5 U</td																	

U - Analyte was not detected above the reporting limit

D - Sample diluted in the lab for analysis.

J - Estimated concentration

**B - Analyte Detected in Method Blank**

-- Not analyzed

K - Analyte present. May be biased High.

L - Analyte present. May be biased low

## R - Data Rejected

**Table 3 (continued)**  
Summary of Surface-Water Quality Data for Army Creek and Army Pond

Parameter	SWE												SWF												
	10/04	1/05	4/05	7/05	10/05	1/06	4/06	7/06	10/06	1/07	4/07	10/09	10/04	1/05	4/05	7/05	10/05	1/06	4/06	7/06	10/06	1/07	4/07	10/09	
<b>Inorganics (µg/l)</b>																									
Aluminum	200 U	--	11.9 U	15.6 U	10.9 U	48.3 U	50.6 U	22.4 U	20.0 U	65.3 U	11.1 U	200 U	200 U	--	11.9 U	13 U	15.1	53.5 U	49.6 U	19.9 U	20.0 U	36.7 U	11.1 U	200 U	
Antimony	2 U	--	3.8 U	3.7 U	1.6 U	1.2 U	1.1 U	1.8 U	1.2 U	1.7 U	2.1 U	60.0 U	2 U	--	3.8 U	3.7 U	1.6 U	1.2 U	1.1 U	1.8 U	1.2 U	1.7 U	2.1 U	60.0 U	
Arsenic	1.8 U	--	3 U	3.7 U	2 U	1.4 U	1.6 U	2.8 U	2.6 U	2.2 U	2.8 U	2.3 J	1.8 U	--	3 U	3.7 U	2 U	1.4 U	1.6 U	2.8 U	2.6 U	2.2 U	2.8 U	10.0 U	
Barium	61	--	71.5	57.9 J	58	20.5	40.9	59.2	51.3	34.2	73.2	68.5 J	63.7	--	68	53.7	62.3	19.8	39.8	60.1	62.8	36.6	71.3	60.5 J	
Beryllium	0.1 U	--	0.1 U	0.62 UU	0.11 U	0.16 U	0.64 U	0.45 U	0.10 U	0.47 U	0.20 U	5.0 U	0.1 U	--	0.1 U	0.38 U	0.12 U	0.17 U	0.66 U	0.41 J	0.10 U	0.30 U	0.20 U	0.20 U	
Cadmium	0.2 U	--	0.4 U	0.5 U	0.2 U	0.20 U	0.40 U	0.20 U	0.20 U	0.40 U	0.5 U	0.2 U	--	0.4 U	0.5 U	0.2 U	0.20 U	0.20 U	0.40 U	0.20 U	0.20 U	0.40 U	0.5 U		
Calcium	20200	--	21400	18500 J	17800	6280	13300	19200	19500	12300	22100	26900	21000	--	20400	17600	19200	6720	13100	19300	19900	13000	22000	23700	
Chromium	0.5 U	--	1.5 U	1.1 UJ	0.6 U	0.43 U	0.60 U	0.50 U	0.52 U	0.60 U	0.30 U	10.0 U	0.5 U	--	1.2 U	1.3 U	0.6 U	0.58 U	0.60 U	0.50 U	0.55 U	0.66	0.30 U	10.0 U	
Cobalt	50 U	--	1.3 U	1.1 U	0.5 U	0.50 U	0.46	0.93	1.4 U	0.62 U	0.90 U	50.0 U	50 U	--	1.1 U	1.6	0.5 U	0.50 U	0.53	0.71	1.1 U	0.61 U	0.90 U	50.0 U	
Copper	0.5 U	--	0.9 U	1.1 J	1.3	1.8	2.5 U	1.5 U	3.5 U	3.1 U	1.6 U	25.0 U	0.5 U	--	0.9 U	1.4	1.6	2.2	2.6 U	1.5 U	3.8 U	3.2 U	1 U	25.0 U	
Dissolved Iron (mg/l)	0.011 U	1.06	0.335	0.139 UU	0.122	0.108	0.310	0.0124 U	0.141	0.324	0.0586 U	0.100 U	0.337	1.07	0.621	0.0914 U	0.0841	0.139	0.287	0.0124 U	0.784	0.382	0.021 U	0.100 U	
Lead	0.9 U	--	1.2 U	1.6 U	1.1 U	1.0 U	1.9 U	1.6 U	1.2 U	1.3 U	10.0 U	0.9 U	--	1.2 U	1.6 U	1.1 U	1.0 U	1.9 U	1.6 U	1.2 U	1.8 U	1.0 U	1.0 U	1.0 U	
Magnesium	7660	--	8600	6960 J	6760	2870	4660	7220	7270	4660	8970	11200	7950	--	8250	6460 J	7370	2540	4520	7310	8150	5030	8930	10400	
Dissolved Manganese (mg/l)	0.236	0.288	0.309	0.177 J	0.148	0.0246	0.103	0.144	0.423	0.0814	0.224	0.239	0.220	0.283	0.254	0.150	0.0691	0.0369	0.0979	0.129	0.397	0.093	0.209	0.130	
Mercury	0.1 U	--	0.1 U	0.1 UU	0.1 U	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U	0.2 U	--	0.1 U	0.1 U	0.1 U	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U	0.20 U	
Nickel	0.5 U	--	3.1 U	2.4 J	3.3	1.5	2.5	1.4	2.8 U	2.0 U	2.2	40.0 U	0.5 U	--	3.4 U	3.1	3	1.4	2.4	1.5	2.7 U	2.3 U	2.2	40.0 U	
Potassium	3730	--	3530 J	4610 J	4330	1990	3430	4600	3160	2790	2710 J	5140 J	3580	--	3380 J	4520 J	5800	1980	3450	4510	4370	3070	2880 J	4740 J	
Selenium	2.6 U	--	2.3 U	4.5 U	4.3 U	3.3 U	1.8 U	2.2 U	2.5 U	2.1 U	2.7 U	35.0 U	3.1	--	4.1 U	4.5 U	4.3 U	3.3 U	1.8 U	2.2 U	2.5 U	2.1 U	2.7 U	35.0 U	
Silver	0.7 U	--	1.4 U	1.3 U	0.2 U	0.50 U	0.50 U	0.30 U	0.59 U	0.40 U	1.2 U	10.0 U	0.7 U	--	1.4 U	1.3 U	0.2 U	0.50 U	0.50 U	0.30 U	0.59 U	0.40 U	1.2 U	10.0 U	
Sodium	30300	--	54600	41500 J	22300	6050	20600	30300	21400	13200	52900	65600	32300	--	53600	46400	23300	9120	20000	31700	26600	13800	53000	56600	
Thallium	1.9 U	--	2.9 U	4 U	4.5 U	3.9 U	2.1 U	3.6 U	3.2 U	3.4 U	2.9 U	25.0 U	1.9 U	--	2.9 U	4 U	4.5 U	3.9 U	2.1 U	3.6 U	3.2 U	3.4 U	2.9 U	25.0 U	
Vanadium	0.4 U	--	1 U	0.8 U	0.5 U	0.31	0.74 U	0.30 U	0.40 U	0.81 U	0.50 U	50.0 U	0.4 U	--	1 U	1	0.5 U	0.57	0.77 U	0.30 U	0.61 U	0.79 U	0.50 U	50.0 U	
Zinc	8.1	--	14.3 U	8.3 UJ	15.5	9.2	11.8	9.7 U	7.1	13.1 U	10	60.0 U	10.3	--	13.6 U	10.9 UU	15.2	11.4	13.8	8.9 U	8.6	12.6 U	9	60.0 U	
<b>Pesticides/Herbicides (µg/l)</b>																									
4,4'-DDD	0.02 U	0.02 U	0.02 U	0.02 UJ	0.002 J	0.020 U	--	--	--	--	--	0.10 U	0.02 U	0.02 U	0.02 U	0.02 UJ	0.02 U	0.020 U	--	--	--	--	--	--	0.10 U
4,4'-DDE	0.02 U	0.02 U	0.02 U	0.02 U	0.0027 JN	0.01 J	0.020 U	--	--	--	--	0.10 U	0.02 U	0.02 U	0.02 U	0.0016 J	0.02 U	0.020 U	--	--	--	--	--	--	0.10 U
4,4'-DDT	0.02 U	0.02 U	0.02 U	0.02 U	0.02 U	0.020 U	--	--	--	--	--	0.10 U	0.02 U	0.0033 J	0.02 U	0.02 U	0.02 U	0.020 U	--	--	--	--	--	--	0.10 U
Aldrin	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.010 U	--	--	--	--	0.050 U	0.01 U	0.01 U	0.01 U	0.01 UU	0.01 U	0.010 U	--	--	--	--	--	--	0.050 U
alpha-BHC	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.010 U	--	--	--	--	0.050 U	0.01 U	0.01 U	0.01 U	0.01 UU	0.01 U	0.010 U	--	--	--	--	--	--	0.050 U
Alpha-Chlorodane	0.01 UJ	0.01 U	0.01 U	0.01 U	0.01 U	0.0049 J	0.010 U	--	--	--	--	0.050 U	0.01 U	0.01 U	0.01 U	0.01 UU	0.01 U	0.010 U	--	--	--	--	--	--	0.050 U
beta-BHC	0.01 U	0.01 U	0.01 U	0.017 J	0.01 U	0.010 U	--	--	--	--	--	0.050 U	0.01 U	0.01 U	0.01 U	0.0067 J	0.01 U	0.010 U	--	--	--	--	--	--	0.050 U
delta-BHC	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.010 U	--	--	--	--	0.050 U	0.01 U	0.01 U	0.01 U	0.01 UU	0.01 U	0.010 U	--	--	--	--	--	--	0.050 U
Dieldrin	0.02 U	0.02 U	0.0068 J	0.02 UU	0.0073 J	0.020 U	--	--	--	--	--	0.10 U	0.0076 J	0.011 J	0.0078 J	0.02 UU	0.0053 J	0.020 U	--	--	--	--	--	--	0.10 U
Endosulfan I	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.0014 J	--	--	--	--	--	0.050 U	0.01 U	0.01 U	0.01 U	0.01 UU	0.01 U	0.0023 J	--	--	--	--	--	--	0.050 U
Endosulfan II	0.02 U	0.02 U	0.02 U	0.02 U	0.02 U	0.020 U	--	--	--	--	--	0.10 U	0.02 U	0.02 U	0.02 U	0.02 UU	0.02 U	0.020 U	--	--	--	--	--	--	0.10 U
Endosulfan sulfate	0.02 U	0.02 U	0.02 U	0.02 U	0.02 U	0.0073 J	0.020 U	--	--	--	--	0.10 U	0.02 U	0.02 U	0.02 U	0.02 UU	0.02 U	0.020 U	--	--	--	--	--	--	0.10 U
Endrin	0.02 U	0.02 U	0.02 U	0.02 U	0.02 U	0.020 U	--	--	--	--	--	0.10 U	0.02 U	0.02 U	0.02 U	0.02 UU	0.02 U	0.020 U	--	--	--	--	--	--	0.10 U
Endrin Aldehyde	0.02 U	0.02 U	0.02 U	0.02 U	0.02 U	0.020 U	--	--	--	--	--	0.10 U	0.02 U	0.02 U	0.02 U	0.02 UU	0.02 U	0.020 U	--	--	--	--	--	--	0.10 U
Endrin Ketone	0.02 U	0.02 U	0.02 U	0.02 U	0.02 U	0.020 U	--	--	--	--	--	0.10 U	0.02 U	0.02 U	0.02 U	0.02 UU	0.02 U	0.020 U	--	--	--	--	--	--	0.10 U
gamma-BHC (Lindane)	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.010 U	--	--	--	--	--	0.050 U	0.01 U	0.01 U	0.01 U	0.01 UU	0.01 U	0.010 U	--	--	--	--	--	--	0.050 U
gamma-Chlorodane	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.010 U	--	--	--	--	--	0.050 U	0.01 U	0.01 U	0.01 U	0.01 UU	0.01 U	0.010 U	--	--	--	--	--	--	0.050 U
Heptachlor	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.010 U	--	--	--	--	0.050 U	0.01 U	0.01 U	0.01 U	0.01 UU	0.01 U	0.010 U	--	--	--	--	--	--	0.050 U
Heptachlor Epoxide	0.01 U	0.01 U	0.01 U	0.016 JN	0.01 U	0.01 U	0.010 U	--	--	--	--	0.050 U	0.01 U	0.01 U	0.01 U	0.017 UU	0.01 U	0.010 U	--	--	--	--	--	--	0.050 U
Methoxychlor	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.10 U	--	--	--	--	0.050 U	0.1 U	0.1 U	0.1 U	0.1 UU	0.047 J	0.10 U	--	--	--	--	--	--	0.050 U
Toxaphene	--	--	--	--	1 UJ	1 U	1.0 U	--	--	--	--	5.0 U	--	--	--	1 UJ	1 U	1.0 U	--	--	--	--	--	--	5.0 U

U - Analyte was not detected above the reporting limit.  
 J - Estimated concentration.  
 B - Analyte Detected in Method Blank  
 -- Not analyzed  
 N - Analysis indicates the presence of an analyte for which there is presumptive evidence to make a "tentative identification"

D - Sample diluted in the lab for analysis.  
 K - Analyte present. May be biased High.  
 L - Analyte present. May be

**Table 3 (continued)**

Summary of Surface-Water Quality Data for Army Creek and Army Pond

Parameter	SWG											
	10/04	1/05	4/05	7/05	10/05	1/06	4/06	7/06	10/06	1/07	4/07	10/09
<b>Non-Halogenated VOCs (µg/l)</b>												
Benzene	0.5 U	5 U	5 U	5 U	5 WJ	10 U	1 U	1 U	1 U	1 U	1 U	--
Toluene	0.5 U	5 U	5 U	5 U	5 WJ	10 U	0.19 J	1 U	1 U	1 U	1 U	--
Ethylbenzene	0.5 U	5 U	5 U	5 U	5 WJ	10 U	1 U	1 U	1 U	1 U	1 U	--
Xylene (total)	0.5 U	5 U	5 U	5 U	5 U	10 U	3 U	3 U	3 U	3 U	3 U	--
2-Butanone	5 U	10 U	10 R	10 R	10 U	10 U	5 U	5 U	5 U	5 U	5 U	--
Acetone	5 U	20 R	20 R	20 R	10 U	10 U	5 WJ	11 U	5 U	5 WJ	5 U	--
Carbon Disulfide	0.5 U	5 U	5 U	5 U	5 WJ	10 U	1 U	1 U	1 U	1 U	1 U	--
Cyclohexane	0.5 U	--	--	--	--	10 U	1 U	1 U	1 U	1 U	1 U	--
Isopropylbenzene	0.5 U	--	--	--	--	10 U	1 U	1 U	1 U	1 U	1 U	--
Methyl-tert-butyl ether	0.5 K	--	--	--	--	1.1 J	1 U	1 U	1 U	1 U	1 U	--
Methylcyclohexane	0.5 U	--	--	--	--	10 U	1 U	1 U	1 U	1 U	1 U	--
4-Methyl-2-pentanone	5 U	--	10 U	10 U	10 U	10 U	5 U	5 U	5 U	5 U	5 U	--
<b>Halogenated VOCs (µg/l)</b>												
Bromoform	0.5 U	5 U	5 U	5 U	5 WJ	10 U	1 U	1 U	1 U	1 U	1 UJ	--
Bromodichloromethane	0.5 U	5 U	5 U	5 U	5 WJ	10 U	1 U	1 U	1 U	1 U	1 U	--
Carbon Tetrachloride	0.5 U	5 WJ	5 U	5 WJ	10 U	1 U	1 U	1 U	1 U	1 U	1 U	--
Chlorobenzene	0.5 U	5 U	5 U	5 U	5 WJ	10 U	1 U	1 U	1 U	1 U	1 U	--
Chloroform	0.5 U	5 U	5 U	5 U	5 WJ	10 U	1 U	1 U	1 U	1 U	1 U	--
Chloromethane	0.5 U	5 U	5 U	5 U	5 WJ	10 U	1 U	0.18 J	1 U	1 U	1 U	--
Dibromochloromethane	0.5 U	5 U	5 U	5 U	5 WJ	10 U	1 U	1 U	1 U	1 U	1 U	--
1,2-Dichloroethane	0.5 U	5 U	5 U	5 U	5 WJ	10 U	1 U	1 U	1 U	1 U	1 U	--
1,1-Dichloroethane	0.5 U	5 U	5 U	5 U	5 WJ	10 U	1 U	1 U	1 U	1 U	1 U	--
cis-1,2-Dichloroethene	0.5 U	5 U	5 U	5 U	5 WJ	10 U	1 U	1 U	1 U	1 U	1 U	--
trans-1,2-Dichloroethene	0.5 U	5 U	5 U	5 U	5 WJ	10 U	1 U	1 U	1 U	1 U	1 U	--
1,1-Dichloroethylene	0.5 U	5 U	5 U	5 U	5 WJ	10 U	1 U	1 U	1 U	1 U	1 U	--
1,2-Dichlorobenzene	0.5 U	--	--	--	--	10 U	1 U	1 U	1 U	1 U	1 U	--
1,3-Dichlorobenzene	0.5 U	--	--	--	--	10 U	1 U	1 U	1 U	1 U	1 U	--
1,4-Dichlorobenzene	0.5 U	--	--	--	--	10 U	1 U	1 U	1 U	1 U	1 U	--
Chloroethane	0.5 U	5 U	5 U	5 U	5 WJ	10 U	1 R	1 U	1 U	1 U	1 U	--
Tetrachloroethene	0.5 U	5 U	5 U	5 U	5 WJ	10 U	1 U	1 U	1 U	1 U	1 U	--
1,1,1-Trichloroethane	0.5 U	5 U	5 U	5 U	5 WJ	10 U	1 U	1 U	1 U	1 U	1 U	--
Trichloroethene	0.5 U	5 U	5 U	5 U	5 WJ	10 U	1 U	1 U	1 U	1 U	1 U	--
Vinyl Chloride	0.5 U	5 U	5 U	5 U	5 WJ	10 U	1 U	1 U	1 U	1 U	1 U	--
1,2,4-Trichlorobenzene	0.5 U	--	--	--	--	10 U	1 U	1 U	1 U	1 U	1 U	--
cis-1,3-Dichloropropene	0.5 U	5 U	5 U	5 U	5 WJ	10 U	1 U	1 U	1 U	1 U	1 U	--
Methylene Chloride	0.27 K	5 U	5 U	5 U	5 WJ	10 U	1 U	1 UJ	1 UJ	1 UJ	1 UJ	--
Trichlorofluoromethane	0.5 U	--	--	--	--	10 U	1 UJ	1 U	1 U	1 U	1 U	--
<b>Semi-Volatiles (µg/l)</b>												
1,1'-Biphenyl	5 U	5 U	5 U	5 UL	5 U	5 U	5 U	5 U	5 U	5 U	5.1 U	
2,2'-oxybis (1-Chloropropane)	5 U	5 U	5 U	5 WJ	5 U	5 WJ	5 U	5 U	5 U	5 U	5.1 U	
2,4-Dimethylphenol	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5.1 U	
2,4-Dinitrophenol	20 U	20 U	20 UJ	20 UL	20 U	20 U	20 UL	20 U	20 U	20 UL	10 U	
2,6-Dinitrotoluene	5 UJ	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5.1 U	
2-Methylnaphthalene	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5.1 U	
2-Methylphenol	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5.1 U	
4,6-Dinitro-2-methylphenol	20 U	20 U	20 U	20 UJ	20 U	20 U	20 U	20 U	20 U	20 UL	10 U	
4-Methylphenol	5 U	5 U	5 U	5 WJ	5 U	5 U	5 U	5 U	5 U	5 U	5.1 U	
Acetophenone	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5.1 U	
Atrazine	5 WJ	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5.1 UJ	
Benzaldehyde	5 UJ	5 U	5 U	5 UL	5 U	5 U	5 U	5 U	5 U	5 U	5.1 UJ	
Benzo (a) pyrene	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5.1 U	
Benzo (b) Fluoranthene	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5.1 U	
Benzo (g,h,i) Perylene	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5.1 U	
Benzo (k) Fluoranthene	5 UJ	5 U	5 U	5 UL	5 U	5 U	5 U	5 U	5 U	5 U	5.1 U	
Bis(2-chloroethyl)Ether	0.019 U	0.021	0.041	0.02 UJ	0.019 UL	5 U	5 U	5 U	5 U	5 U	5 U	--
Bis(2-ethylhexyl)phthalate	5 U	5 U	5 U	5 UL	5 U	5 U	5 U	5 U	5 U	5 U	5.1 U	
Caprolactam	5 UJ	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5.1 U	
Di-n-butyl phthalate	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5.1 U	
Di-n-octyl phthalate	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5.1 U	
Dibenzo (a,h) Anthracene	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5.1 U	
Diethylphthalate	5 U	5 U	5 U	5 UL	5 U	5 U	5 U	5 U	5 U	5 U	5.1 U	
Hexachlorocyclopentadiene	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5.1 U	
Indeno (1,2,3-cd) Pyrene	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5.1 U	
N-Nitrosodiphenylamine	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5.1 U	
Naphthalene	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5.1 U	
Pentachlorophenol	5 U	5 U	5 U	5 UL	5 U	5 U	5 U	5 U	5 U	5 U	5.1 U	
Phenol	5 U	5 U	5 U	5 UL	5 U	5 U	5 U	5 U	5 U	5 U	5.1 U	
<b>Biological Oxygen Demand (mg/l)</b>												
--	--	1.8	4.4	2.4	3.9	3	10	5	--	--	--	
<b>Field Parameters</b>												
Temperature (Degrees Celsius)	16.2	--	11.7	23.01	12.3	7.1	19.2	29.6	19.0	6.3	20.4	11.9
Conductivity (µS/cm)	338	--	291	299	294	105	273	270	278	107	334	554
pH (standard units)	8.25	--	5.89	6.40	6.76	7.40	7.08	6.93	6.94	6.62	7.66	7.23
Dissolved Oxygen (mg/l)	5.38	--	7.55	1.78	3.83	9.93	7.45	7.44	7.03	9.36	10.55	3.24
ORP (mV)	-7.3	--	51	76.9	-24	160	82	55	37	42	77	48

U - Analyte was not detected above the reporting limit.

D - Sample diluted in the lab for analysis.

J - Estimated concentration.

K - Analyte present. May be biased High.

B - Analyte Detected in Method Blank

L - Analyte present. May be biased low

-- Not analyzed.

R - Data Rejected

UL - Not detected, quantitation limit is probably higher

**Table 3 (continued)**  
Summary of Surface-Water Quality Data for Army Creek and Army Pond

Parameter	SWG											
	10/04	1/05	4/05	7/05	10/05	1/06	4/06	7/06	10/06	1/07	4/07	10/09
<b>Inorganics (µg/l)</b>												
Aluminum	4.4 U	--	11.9 U	18.7 UJ	27.1 U	83.7 U	50.5 U	37.6 U	20.0 U	43.0 U	11.1 U	200 U
Antimony	2 U	--	3.8 U	3.7 UJ	1.6 U	1.2 U	1.1 U	1.8 U	1.2 U	1.7 U	2.1 U	60.0 U
Arsenic	1.8 U	--	3 U	3.7 UJ	2 U	2.4	1.6 U	2.8 U	2.6 U	2.2 U	2.8 U	10.0 U
Barium	52.6	--	51.1	59.4 J	70.5	17.9	48.3	47.3	55.1	30.6	67.5	46.3 J
Beryllium	0.1 U	--	0.1 U	0.59 UJ	0.2 U	0.38 U	0.65 U	0.62 U	0.10 U	0.30 U	0.20 U	5.0 U
Cadmium	0.2 U	--	0.4 U	0.5 UJ	0.2 U	0.23 U	0.20 U	0.40 U	0.20 U	0.20 U	0.40 U	5.0 U
Calcium	18600	--	17200	20100 J	18000	6150	13500	17800	19000	11100	22300	22700
Chromium	0.5 U	--	1.6 U	1.1 UJ	0.6 U	0.72 U	0.60 U	0.50 U	0.77 U	0.60 U	0.30 U	10.0 U
Cobalt	50 U	--	11 U	1.1 UJ	0.75	0.50 U	0.40	2.4	0.65 U	0.40 U	0.90 U	50.0 U
Copper	0.5 U	--	0.99	0.83 J	1.2	2.4	2.2 U	1.7	3.4 U	3.3 U	1.2 U	25.0 U
Dissolved Iron (mg/l)	0.011 U	0.713	0.207 U	0.571 J	1.29	0.159	0.390	0.112	0.0663 U	0.295	0.108 U	0.100 U
Lead	0.9 U	--	1.2 U	1.6 UJ	1.1 U	1.0 U	1.0 U	1.9 U	1.6 U	1.2 U	1.5 U	10.0 U
Magnesium	7060	--	6240	8780 J	7410	2090	5070	6760	7090	3950	8610	9900
Dissolved Manganese (mg/l)	0.173	0.339	0.263	0.190 J	0.322	0.0404	0.188	0.126	0.163	0.0787	0.164	0.0865
Mercury	0.2 U	--	0.1 U	0.1 UJ	0.1 U	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U	0.20 U
Nickel	0.5 U	--	3.6 U	2.9 J	2.6	1.5	2.0	1.4	1.9 U	2.2 U	2.5	40.0 U
Potassium	3560	--	3140 J	3580 J	4270	1810	3520	4390	4160	2910	2420 J	4790 J
Selenium	2.6 U	--	1.7 U	4.5 J	4.3 U	3.3 U	1.8 U	2.2 U	2.5 U	2.1 U	2.7 U	35.0 U
Silver	0.7 U	--	1.4 U	1.3 UJ	0.2 U	0.50 U	0.50 U	0.30 U	0.53 U	0.40 U	1.2 U	10.0 U
Sodium	24100	--	26900	26800 J	18700	6130	17300	17700	17900	11300	43300	36000
Thallium	1.9 U	--	2.9 U	4 UJ	4.5 U	3.9 U	2.1 U	3.6 U	3.3 U	3.4 U	2.9 U	25.0 U
Vanadium	0.4 U	--	1 U	0.96 J	0.5 U	0.85	0.59 U	0.78	0.40 U	0.67 U	0.50 U	50.0 U
Zinc	8.7	--	10.7 U	5.3 UJ	13.1	11	6.1	7.7 U	6.2	10.7 U	8.8	60.0 U
<b>Pesticides/Herbicides (µg/l)</b>												
4,4'-DDD	0.02 U	0.02 U	0.02 U	0.02 U	0.02 UJ	0.02 U	0.020 U	--	--	--	--	0.10 U
4,4'-DDE	0.02 U	0.02 U	0.02 U	0.0039 J	0.0077 J	0.020 U	--	--	--	--	--	0.10 U
4,4'-DDT	0.02 U	0.02 U	0.02 U	0.02 UJ	0.02 U	0.020 U	--	--	--	--	--	0.10 U
Aldrin	0.01 U	0.01 U	0.01 U	0.01 UJ	0.01 U	0.010 U	--	--	--	--	--	0.050 U
alpha-BHC	0.01 U	0.01 U	0.01 U	0.01 UJ	0.01 U	0.010 U	--	--	--	--	--	0.050 U
Alpha-Chlorodane	0.01 U	0.01 U	0.01 U	0.01 UJ	0.01 U	0.010 U	--	--	--	--	--	0.050 U
beta-BHC	0.01 U	0.01 U	0.01 U	0.01 UJ	0.01 U	0.010 U	--	--	--	--	--	0.050 U
delta-BHC	0.01 U	0.01 U	0.01 U	0.01 UJ	0.01 U	0.010 U	--	--	--	--	--	0.050 U
Dieldrin	0.02 U	0.0083 J	0.02 U	0.0071 JN	0.02 U	0.020 U	--	--	--	--	--	0.10 U
Endosulfan I	0.01 U	0.01 U	0.01 U	0.01 UJ	0.01 U	0.0035 J	--	--	--	--	--	0.050 U
Endosulfan II	0.02 U	0.02 U	0.02 U	0.02 UJ	0.02 U	0.020 U	--	--	--	--	--	0.10 U
Endosulfan sulfate	0.02 U	0.02 U	0.02 U	0.02 UJ	0.02 U	0.020 U	--	--	--	--	--	0.10 U
Endrin	0.02 U	0.02 U	0.02 U	0.02 UJ	0.02 U	0.020 U	--	--	--	--	--	0.10 U
Endrin Aldehyde	0.02 U	0.02 U	0.02 U	0.02 UJ	0.02 U	0.020 U	--	--	--	--	--	0.10 U
Endrin Ketone	0.02 U	0.02 U	0.02 U	0.02 UJ	0.02 U	0.020 U	--	--	--	--	--	0.10 U
gamma-BHC (Lindane)	0.01 U	0.01 U	0.01 U	0.01 UJ	0.01 U	0.010 U	--	--	--	--	--	0.050 U
gamma-Chlorodane	0.01 U	0.01 U	0.01 U	0.01 UJ	0.01 U	0.010 U	--	--	--	--	--	0.050 U
Heptachlor	0.01 U	0.01 U	0.01 U	0.01 UJ	0.01 U	0.010 U	--	--	--	--	--	0.050 U
Heptachlor Epoxide	0.01 U	0.01 U	0.025 J	0.01 UJ	0.01 U	0.010 U	--	--	--	--	--	0.050 U
Methoxychlor	0.1 U	0.1 U	0.1 U	0.1 UJ	0.1 U	0.10 U	--	--	--	--	--	0.050 U
Toxaphene	--	--	--	1 UJ	1 U	1.0 U	--	--	--	--	--	5.0 U

N - Analysis indicates the presence of an analyte for which there is presumptive evidence to make a "tentative identification"

U - Analyte was not detected above the reporting limit.

D - Sample diluted in the lab for analysis.

J - Estimated concentration.

K - Analyte present. May be biased High.

B - Analyte Detected in Method Blank

L - Analyte present. May be biased low

-- Not analyzed

R - Data Rejected

P - Discrepancy in GC analysis. Lower value reported.

**Table 4**  
Summary of Sediment Data for Army Creek and Army Pond

Parameter	SEDA												SEDB											
	10/04	1/05	4/05	7/05	10/05	1/06	4/06	7/06	10/06	1/07	4/07	10/09	10/04	1/05	4/05	7/05	10/05	1/06	4/06	7/06	10/06	1/07	4/07	10/09
<b>Semi-Volatiles (µg/kg)</b>																								
1,1'-Biphenyl	410 U	520 U	520 UJ	520 UJ	500 U	540 U	480 U	530 U	460 U	510 U	500 U	270 U	520 U	490 U	470 UJ	410 UJ	450 U	730 U	650 U	410 U	450 U	750 U	460 U	500 U
2,2'-Oxybis (1-Chloropropane)	410 U	520 UL	520 UJ	520 U	500 U	540 U	480 U	530 U	460 U	510 U	500 U	270 U	520 U	490 UL	470 UJ	410 UL	450 U	730 U	650 U	410 U	450 U	750 U	460 U	500 U
2,4-Dimethylphenol	410 U	520 UL	520 U	520 UJ	500 U	540 U	480 U	530 U	460 U	510 U	500 U	270 U	520 U	490 UL	470 UJ	410 UJ	450 U	730 U	650 U	410 U	450 U	750 U	460 U	500 U
2,4-Dinitrophenol	1000 UJ	1300 U	1300 UL	1300 UJ	1300 UL	1400 UL	1200 UL	1300 R	1200 UL	1300 U	520 U	1300 UJ	1200 U	1200 UL	1000 UJ	1100 UL	1800 UL	1600 UL	1000 R	1100 UL	1900 UL	1200 U	970 U	
2,6-Dinitrotoluene	410 U	520 U	520 U	520 UJ	500 U	540 U	480 U	530 U	460 U	510 U	500 U	270 U	520 U	490 U	470 UJ	410 UJ	450 U	730 U	650 U	410 U	450 U	750 U	460 U	500 U
2-Methylnaphthalene	410 U	520 U	520 UJ	520 U	500 U	540 U	480 U	530 U	460 U	510 U	500 U	270 U	520 U	490 U	470 UJ	410 UJ	450 U	730 U	650 U	410 U	450 U	750 U	460 U	500 U
4,6-Dinitro-2-methylphenol	1000 UJ	1300 UL	1300 U	1300 UJ	1300 U	1400 UL	1200 U	1300 UL	1200 U	1300 U	520 U	1300 UJ	1200 UL	1200 U	1000 UJ	1100 U	1800 UL	1600 U	1000 UL	1100 U	1900 UL	1200 U	970 U	
4-Methylphenol	410 U	520 U	520 U	520 UJ	500 U	540 U	480 U	530 U	460 U	510 U	500 U	270 U	520 U	490 U	520 U	410 UJ	450 U	730 U	650 U	410 U	450 U	750 U	460 U	500 U
Acetophenone	410 U	520 U	520 U	520 UJ	500 U	540 U	480 U	530 U	460 U	510 U	500 U	180 J	520 U	490 U	520 U	410 UJ	450 U	730 U	650 U	410 U	450 U	750 U	460 U	370 J
Atrazine	410 U	520 U	520 UJ	520 U	500 U	540 U	480 U	530 U	460 U	510 U	500 U	270 U	520 U	490 U	520 UJ	410 UL	450 U	730 U	650 U	410 U	450 U	750 U	460 U	500 UJ
Benzaldehyde	410 UJ	520 U	520 U	520 UJ	500 U	540 U	480 U	530 U	460 U	510 U	500 U	270 UJ	520 UJ	490 U	520 U	410 UJ	450 U	730 U	650 U	410 U	450 U	750 U	460 U	500 UJ
Benzo (a) anthracene	410 U	520 U	520 U	520 UJ	500 U	540 U	480 U	530 U	460 U	510 U	500 U	270 U	520 U	490 U	470 U	410 UJ	450 U	730 U	650 U	410 U	450 U	750 U	460 U	500 U
Benzo (a) pyrene	410 U	520 U	520 U	520 UJ	500 U	540 U	480 U	530 U	460 U	510 U	500 U	270 U	520 U	490 U	470 U	410 UJ	450 U	730 U	650 U	410 U	450 U	750 U	460 U	500 U
Benzo (b) Fluoranthene	410 U	520 U	520 U	520 UJ	500 U	540 U	480 U	530 U	460 U	510 U	500 U	270 U	520 U	490 U	470 U	410 UJ	450 U	730 U	650 U	410 U	450 U	750 U	460 U	500 U
Benzo (g,h,i) Perylene	410 U	520 U	520 U	520 UJ	500 U	540 U	480 U	530 U	460 U	510 U	500 U	270 U	520 U	490 U	470 U	410 UJ	450 U	730 U	650 U	410 U	450 U	750 U	460 U	500 U
Benzo (k) Fluoranthene	410 UJ	520 U	520 U	520 UJ	500 U	540 U	480 U	530 U	460 U	510 U	500 U	270 U	520 UJ	490 U	520 U	410 UJ	450 U	730 U	650 U	410 U	450 U	750 U	460 U	500 U
Bis(2-chloroethyl)Ether	0.41 UJ	1.1	0.52 U	2.1 J	2 U	540 U	480 U	530 U	460 U	510 U	500 U	270 U	0.79 J	0.5	0.48 U	1.6 U	1.8 U	730 U	650 U	410 U	450 U	750 U	460 U	500 U
Bis(2-ethylhexyl)phthalate	410 U	520 U	520 UJ	520 U	500 U	540 U	110 J	530 U	460 U	510 U	500 U	670	520 U	490 U	470 UJ	410 UJ	450 U	730 U	650 U	410 U	450 U	750 U	460 U	500 U
Caprolactam	410 U	520 U	520 U	520 UJ	500 U	540 U	480 U	530 U	460 U	510 U	500 U	270 U	520 U	490 U	470 U	410 UJ	450 U	730 U	650 U	410 U	450 U	750 U	460 U	500 U
Di-n-butyl phthalate	410 U	520 UL	520 U	520 UJ	500 U	540 U	480 U	530 U	460 U	510 U	500 U	270 U	520 U	490 UL	470 U	410 UJ	450 U	730 U	650 U	410 U	450 U	750 U	460 U	500 U
Di-n-octyl phthalate	410 UJ	520 U	520 UJ	520 U	500 U	540 U	480 U	530 U	460 U	510 U	500 U	270 U	520 UJ	490 U	470 UJ	410 UJ	450 U	730 U	650 U	410 U	450 U	750 U	460 U	500 U
Dibenzo (a,h) Anthracene	410 U	520 U	520 U	520 UJ	500 U	540 U	480 U	530 U	460 U	510 U	500 U	270 U	520 U	490 U	470 U	410 UJ	450 U	730 U	650 U	410 U	450 U	750 U	460 U	500 U
Diethylphthalate	410 U	520 U	520 U	520 UJ	500 U	540 U	480 UJ	530 U	460 U	510 U	500 U	270 U	520 U	490 U	470 U	410 UJ	450 U	730 U	650 U	410 U	450 U	750 U	460 U	500 U
Hexachlorocyclopentadiene	410 UJ	520 U	520 U	520 UJ	500 U	540 U	480 U	530 U	460 UL	510 UL	500 UL	270 R	520 UJ	490 U	470 U	410 UJ	450 U	730 U	650 U	410 UL	450 UL	750 UL	460 UL	500 R
Indeno (1,2,3-cd) Pyrene	410 U	520 U	520 U	520 UJ	500 U	540 U	480 U	530 U	460 U	510 U	500 U	270 U	520 U	490 U	470 U	410 UJ	450 U	730 U	650 U	410 U	450 U	750 U	460 U	500 U
N-Nitrosodiphenylamine	410 U	520 U	520 U	520 UJ	500 U	540 U	480 U	530 U	460 U	510 U	500 U	270 U	520 U	490 U	470 U	410 UJ	450 U	730 U	650 U	410 U	450 U	750 U	460 U	500 U
Naphthalene	410 U	520 U	520 U	520 UJ	500 U	540 U	480 U	530 U	460 U	510 U	500 U	270 U	520 U	490 U	470 U	410 UJ	450 U	730 U	650 U	410 U	450 U	750 U	460 U	500 U
Pentachlorophenol	1000 UJ	1300 U	1300 U	1300 UJ	1300 UL	1400 U	1200 U	1300 UL	1200 UL	1300 U	520 U	1300 UJ	1200 U	1200 UL	1000 UJ	1100 UL	1800 U	1600 U	1000 UL	1100 UL	1900 U	1200 U	970 U	
Phenol	410 U	520 U	520 U	520 UJ	500 U	540 U	480 U	530 U	460 U	510 U	500 U	270 U	520 U	490 U	470 U	410 UJ	450 U	730 U	650 UJ	410 U	450 U	750 U	460 U	500 U
Chrysene	410 U	520 U	520 U	520 UJ	500 U	540 U	480 U	530 U	460 U	510 U	500 U	270 U	520 U	490 U	470 U	410 UJ	450 U	730 U	650 U	410 U	450 U	750 U	460 U	77 J
Fluoranthene	410 U	520 U	520 U	520 UJ	500 U	540 U	480 U	530 U	460 U	510 U	500 U	270 U	520 U	490 U	470 U	410 UJ	450 U	730 U	150 J	410 U	450 U	750 U	460 U	94 J
Phenanthrene	410 U	520 U	520 U	520 UJ	500 U	540 U	480 U	530 U	460 U	510 U	500 U	270 U	520 U	490 U	470 U	410 UJ	450 U	730 U	650 U	410 U	450 U	750 U	460 U	500 U
Carbazole	410 U	520 U	520 U	520 UJ	500 U	540 U	480 U	530 UL	460 UL	510 U	500 U	270 U	520 U	490 U	470 U	410 UJ	450 U	730 U	650 U	410 UL	450 UL	750 U	460 U	500 U
Pyrene	410 U	520 U	520 U	520 UJ	500 U	540 U	480 U	530 U	460 U	510 U	500 U	270 U	520 U	490 U	470 U	410 UJ	450 U	730 U	650 U	410 U	450 U	750 U	460 U	500 U

U - Analyte was not detected above the reporting limit.

UL - Not detected, quantitation limit is probably higher

J - Estimated concentration.

-- Not analyzed

K - Analyte present. May be biased High.

L - Analyte present. May be biased low

R - Data Rejected

**Table 4 (continued)**  
Summary of Sediment Data for Army Creek and Army Pond

Parameter	SEDA												SEDB													
	10/04	1/05	4/05	7/05	10/05	1/06	4/06	7/06	10/06	1/07	4/07	10/09	10/04	1/05	4/05	7/05	10/05	1/06	4/06	7/06	10/06	1/07	4/07	10/09		
<b>Inorganics (mg/kg)</b>																										
Aluminum	28300	48100	22900	25100 J	23000	24000	28100	22700	23500	34600	32500	21900 J	25900	29900	11400 L	1840 J	4330	16700	13200	1340	2270	18400	1730	19500 J		
Antimony	0.48 U	0.9 J	1.2 UL	1.1 UJ	0.86 UJ	0.98 J	0.74 L	1.1 UJ	0.99 UU	1.3 L	0.64 R	10.6 UL	0.59 U	0.85 J	1 UL	0.86 U	0.42 UJ	1.1 J	0.53 L	0.74 UJ	0.30 UU	0.77 UL	0.57 R	0.67 UL		
Arsenic	3	4.3	4.5	2.9 J	3.2	5.7	3.8	3.9	3.9	5.9	4.1 L	3.6	3.9	4.8	2.8 L	0.86 UJ	0.79	5.0	1.7 J	0.69 U	0.65 U	4.2	0.76 UL	4.3		
Barium	66.2	137	75.9	67.5 J	93.3	92.6	131	84.7	87.9	129	87.0	88.1	96.6	103	55.4 U	10.4 J	25.6	137	106	7.7	19.5	156	10.4	182		
Beryllium	0.84	1.4	0.74 U	0.83 J	0.51	0.93	1.1	0.72 U	0.95 U	1.4	1.3	1.2	1	0.95	0.4 U	0.13 J	0.17	0.83	0.92	0.15 U	0.22 U	1.1	0.13 U	1.4 J		
Cadmium	0.23	0.86	1.1 U	0.2 J	0.12	0.082	0.058 U	0.13 U	0.48 U	0.062 U	0.12 U	0.88 U	0.21	0.73	0.71 U	0.12 UJ	0.053 U	0.088 U	0.18	0.099 U	0.050 U	0.15 U	0.11 U	1.7 U		
Calcium	698	794	1070 J	687 J	980	1310	1120	580 J	650 J	1120 J	795	746 J	696	786	644 UJ	137 UJ	347	2690	2940	108 J	734 J	2850 J	152	3560 J		
Chromium	20.5	42 J	19.3	20.1 J	21.6	23.8	21.0	21.5	30.1	28.8	21.4 J	26.3	29.6 J	11.9 L	3.6 J	8.7	20.8	15.3	2.4	4.0	27.2	5.0	26.9 J			
Cobalt	14.9	12.5 J	10.9 U	12.4 J	16.7	17.7	18.9	21.0 J	15.5	25.8	14.8	19.9	12.3	18.7 J	11.1 L	4.1 J	5.7	18.4	10	2.2 J	6.1	23.6	6.4	15.9 J		
Copper	9.1	17.9	9.1	8.7 J	12.3	14.2	14.0	11.4	12.5	15.5	12.3	13.7 J	12.9	14.2	7.7 L	1.8 J	3.8	16.3	17.2	1.4	3.4	24.8	6.4	31.3 J		
Iron	25500	38100 J	30900	24400 J	26800	33400	30600	36100	30500	47800	56900 J	26300 J	26400	29700 J	16500 L	2990 J	5910	22100	11300	2050	4090	22200	3050 J	18500 J		
Lead	18.4	31.4 J	21.2 J	18.9 J	30.1	57.2	43.1	20.5 J	24.8	33.9	23.7 K	26.2 K	45	33 J	18 L	5.3 J	11.8	56.8	27.8	4.3 J	7.5	57.9	7.7 K	63.5 K		
Magnesium	783	1480 J	716	711 J	1060	1300	1180	766 J	827 J	1200 J	902	874 J	1050	1150 J	556 L	113 J	315	1620	1460	87.6 J	192 J	1880 J	146 U	2130		
Manganese	343	242 J	520 K	264 J	358 J	439	348 L	387 J	374 J	608 L	247	207 J	186	179 J	103 L	24.1 J	46.5 J	418	170 L	13.6 J	37.8 J	302 L	22.9	281 J		
Mercury	3.2	0.89 J	0.078 U	0.058 UU	0.075 U	0.082 U	0.072 U	0.081 U	0.070 U	0.077 U	0.15 U	0.18 U	0.079 U	0.061 UJ	0.068 U	0.056 UJ	0.064 U	0.10 U	0.079	0.063 U	0.061 U	0.099 U	0.070 U	0.36 U		
Nickel	10.9	21.2	11.2	11.6 J	13.8	15.5 J	14.6	12.6	12.1	18.6 J	15.1 J	12.6	13.1	16.7	8.5 L	3 J	5.1	17.2 J	15.2	1.9	3.9	24.6 J	3.2 J	23.4		
Potassium	710	1600	657	651 J	839	947 J	1150	596 J	801 J	1040 J	703 J	680 J	819	1090	411 L	72.7 J	192	838 J	737	46.4 J	83.2 J	885 J	54.5 J	879 J		
Selenium	0.63 U	1.2 UJ	0.52 UL	1.3 UJ	1.3 UU	1.4	0.52 UL	0.71 UJ	0.70 U	0.65 UL	0.82 UL	1.2 J	0.77 U	1.1 UJ	0.49 UJ	1 UJ	1.1 UJ	1.9	1.9 L	0.55 UJ	0.63 U	3.0 L	0.73 UL	4.5 J		
Silver	0.17 U	0.22 U	0.43 U	0.39 UJ	0.06 U	0.16 U	0.14 U	0.097 U	0.14 U	0.12 U	0.36 U	1.8 U	0.21 U	0.2 U	0.37 U	0.3 UJ	0.053 U	0.22 U	0.19 U	0.074 U	0.13 U	0.18 U	0.32 U	3.5 U		
Sodium	152 U	141	126	69.1 U	126	112 U	341	155 U	260	94.9 U	130 U	533 J	193 U	92	57.4 U	55.1 UJ	112	223 J	190	216 U	99.3	175 U	169 U	664 J		
Thallium	0.54	2 U	5.2	1.2 UJ	1.6 J	1.3 U	0.61 U	1.2 U	0.90 U	1.1 U	2	4.4 U	0.56 U	1.7 U	1.2 L	1.7 U	0.80 U	0.89 U	0.81 U	1.5 U	0.78 U	8.6 U				
Vanadium	37.6	77.1	35.1	36.7 J	40.7	46.2	46.1	41.8	43.4	60.5	57.2	46.4 J	48.5	58.2	22.4 L	4.6 J	9.8	46.4	27.0	3.7	6.3	48.7	5.9	49.7 J		
Zinc	38.2	68.7	50.7 J	39.8 J	59.8	72.1	56.5	42.8 J	36.9	61.2	61.0	46.8 J	47.5	57.7	43.9 L	16.6 U	20.7	78.9	90.8	13.1 J	21.6	124	20.0	500 U		
<b>Pesticides/Herbicides (µg/kg)</b>																										
4,4'-DDD	6.8	5.2 U	5.2 U	5.2 UJ	5 U	5.4 U	--	--	--	--	--	5.2 U	6.3	4.9 U	4.7 U	4.1 UJ	4.5 U	7.3 U	--	--	--	--	--	--	9.7 U	
4,4'-DDE	1.8 J	5.2 U	1.7 J	5.2 U	2.3 J	1.6 J	--	--	--	--	--	1.9 J	1.3 J	4.9 U	1.2 J	4.1 UJ	1.6 J	1.7 J	--	--	--	--	--	--	4.5 J	
4,4'-DDT	4.1 U	5.2 U	5.2 U	5.2 U	5 U	5.4 U	--	--	--	--	--	5.2 U	5.2 U	4.9 U	4.7 U	4.1 UJ	4.5 U	7.3 U	--	--	--	--	--	--	9.7 U	
Aldrin	2.1 U	2.7 U	2.7 U	2.7 U	2.6 U	2.8 U	--	--	--	--	--	2.7 U	2.7 U	2.5 U	2.4 U	2.1 UJ	2.3 U	3.8 U	--	--	--	--	--	--	5.0 U	
alpha-BHC	2.1 U	2.7 U	2.7 U	2.7 U	2.6 U	2.8 U	--	--	--	--	--	2.7 U	2.7 U	2.5 U	2.4 U	2.1 UJ	2.3 U	3.8 U	--	--	--	--	--	--	5.0 U	
Alpha-Chlordane	2.1 U	2.7 U	2.7 U	2.7 U	2.6 U	2.8 U	--	--	--	--	--	5.2 U	2.7 U	2.7 U	2.5 U	2.1 UJ	2.3 U	3.8 U	--	--	--	--	--	--	9.7 U	
beta-BHC	2.1 U	2.7 U	2.7 U	2.7 U	2.7 U	2.6 U	--	--	--	--	--	2.7 U	2.7 U	2.5 U	2.4 U	2.1 UJ	2.3 U	3.8 U	--	--	--	--	--	--	5.0 U	
delta-BHC	2.1 U	2.7 U	2.7 U	2.7 U	2.7 U	2.6 U	--	--	--	--	--	2.7 U	2.7 U	2.5 U	2.4 U	2.1 UJ	2.3 U	3.8 U	--	--	--	--	--	--	5.0 U	
Dielectrin	4.1 U	5.2 U	5.2 U	5.2 U	5.2 U	5 U	--	--	--	--	--	5.2 U	5.2 U	4.9 U	4.7 U	4.1 UJ	4.5 U	7.3 U	--	--	--	--	--	--	9.7 U	
Endosulfan I	2.1 U	2.7 U	2.7 U	2.7 U	2.6 U	2.8 U	--	--	--	--	--	2.7 U	2.7 U	2.5 U	2.4 U	2.1 UJ	2.3 U	3.8 U	--	--	--	--	--	--	5.0 U	
Endosulfan II	4.1 U	5.2 U	5.2 U	5.2 U	5.2 U	5 U	--	--	--	--	--	5.2 U	5.2 U	4.9 U	4.7 U	4.1 UJ	4.5 U	7.3 U	--	--	--	--	--	--	9.7 U	
Endosulfan sulfate	4.1 U	5.2 U	5.2 U	5.2 U	5.2 U	5 U	--	--	--	--	--	5.2 U	5.2 U	4.9 U	4.7 U	4.1 UJ	4.5 U	7.3 U	--	--	--	--	--	--	9.7 U	
Endrin	4.1 U	5.2 U	5.2 U	5.2 U	5 U	5.4 U	--	--	--	--	--	5.2 U	5.2 U	4.9 U	4.7 U	4.1 UJ	4.5 U	7.3 U	--	--	--	--	--	--	9.7 U	
Endrin Aldehyde	4.1 U	5.2 U	5.2 U	5.2 U	5 U	5.4 U	--	--	--	--	--	5.2 U	5.2 U	4.9 U	4.7 U	4.1 UJ	4.5 U	7.3 U	--	--	--	--	--	--	9.7 U	
Endrin Ketone	4.1 U	5.2 U	5.2 U	5.2 U	5 U	5.4 U	--	--	--	--	--	5.2 U	5.2 U	4.9 U	4.7 U	4.1 UJ	4.5 U	7.3 U	--	--	--	--	--	--	9.7 U	
gamma-BHC (Lindane)	2.1 U	2.7 U	2.7 U	2.7 U	2.6 U	2.8 U	--	--	--	--	--	2.7 U	2.7 U	2.5 U	2.4 U	2.1 UJ	2.3 U	3.8 U	--	--	--	--	--	--	5.0 U	
gamma-Chlordane	2.1 U	2.7 U	2.7 U	2.7 U	2.6 U	0.62 J	--	--	--	--	--	5.2 U	2.7 U	2.7 U	0.72 J	2.4 U	2.1 UJ	2.3 U	3.8 U	--	--	--	--	--	--	9.7 U
Heptachlor	2.1 U	2.7 U	2.7 U	2.7 U	2.6 U	2.8 U	--	--	--	--	--	2.7 U	2.7 U	2.5 U	2.4 U	2.1 UJ	2.3 U	3.8 U	--	--	--	--	--	--	5.0 U	
Heptachlor Epoxide	2.1 U	2.7 U	2.7 U	2.7 U	2.6 U	2.8 U	--	--	--	--	--	2.7 U	2.7 U	2.5 U	2.4 U	2.1 UJ	2.3 U	3.8 U	--	--	--	--	--	--	5.0 U	
Methoxychlor	21 U	27 U	27 U	27 U	26 U	28 U	--	--	--	--	--	27 U	27 U	25 U	24 U	21 UJ	23 U	38 U	--	--	--	--	--	--	50	
Toxaphene	--	--	--	--	270 UJ	260 U	280 U	--	--	--	--	270 U	--	--	--	210 UJ	230 U	380 U	--	--	--	--	--	--	500 U	

U - Analyte was not detected above the reporting limit.

J - Estimated concentration.

-- Not analyzed.

N - Analysis indicates the presence of an analyte for which there is presumptive evidence to make a "tentative identification"

D - Sample diluted in the lab for analysis.

K - Analyte present. May be biased High.

L - Analyte present. May be biased low

R - Data Rejected

P - Discrepancy in GC analysis. Lower value reported.

S - Sample spike recovery is outside of control limits

**Table 4 (continued)**  
Summary of Sediment Data for Army Creek and Army Pond

Parameter	SEDC												SEDD												
	10/04	1/05	4/05	7/05	10/05	1/06	4/06	7/06	10/06	1/07	4/07	10/09	10/04	1/05	4/05	7/05	10/05	1/06	4/06	7/06	10/06	1/07	4/07	10/09	
<b>Semi-Volatiles (µg/kg)</b>																									
1,1'-Biphenyl	1400 U	470 U	790 UJ	520 UJ	530 U	410 U	400 U	920 UL	670 U	770 U	830 U	280 U	570 U	1000 U	920 UJ	940 UJ	750 U	700 U	700 U	920 UL	850 U	790 U	730 U	590 U	
2,2'-oxybis(1-Chloropropane)	1400 U	470 UL	790 UJ	520 UL	530 U	410 U	400 U	920 UL	670 U	770 U	830 U	280 U	570 U	1000 UL	920 UJ	940 UL	750 U	700 U	700 U	920 UL	850 U	790 U	730 U	590 U	
2,4-Dimethylphenol	1400 U	470 UL	790 U	520 UJ	530 U	410 U	400 U	920 U	670 U	770 U	830 U	280 U	570 U	1000 UL	920 U	940 UJ	750 U	700 U	700 U	920 U	850 U	790 U	730 U	590 U	
2,6-Dinitrotoluene	1400 U	470 U	790 U	520 UJ	530 U	410 U	400 U	920 UL	670 U	770 U	830 U	280 U	570 U	1000 U	920 UJ	940 UJ	750 U	700 U	700 U	920 UL	850 U	790 U	730 U	590 U	
2-Methylnaphthalene	1400 U	470 U	790 UJ	520 UJ	530 U	410 U	400 U	920 UL	670 U	770 U	830 U	280 U	570 U	1000 U	920 UJ	940 UJ	750 U	700 U	700 U	920 UL	850 U	790 U	730 U	590 U	
2-Methylphenol	1400 U	470 U	790 U	520 UJ	530 U	410 U	400 U	920 U	670 U	770 U	830 U	280 U	570 U	1000 U	920 U	940 UJ	750 U	700 U	700 U	920 U	850 U	790 U	730 U	590 U	
4,6-Dinitro-2-methylphenol	3600 UJ	1200 UL	2000 U	1300 UJ	1300 U	1000 UL	2300 R	1700 UL	1900 U	2100 U	540 U	1400 UJ	2600 U	2300 UL	2400 UJ	1900 UL	1800 UL	1800 UL	2300 R	2100 UL	2000 U	1800 U	1100 U		
4-Methylphenol	430 J	470 U	790 U	520 UJ	530 U	410 U	400 U	920 UL	670 U	770 U	830 U	280 U	570 U	1000 U	920 U	940 UJ	750 U	700 U	700 U	920 U	850 U	790 U	730 U	590 U	
Acetophenone	1400 U	470 U	790 U	520 UJ	530 U	410 U	400 U	920 UL	670 U	770 U	830 U	280 U	570 U	1000 U	920 U	940 UJ	750 U	700 U	700 U	920 U	850 U	790 U	730 U	590 U	
Atrazine	1400 U	470 U	790 UJ	520 UL	530 U	410 U	400 U	920 UL	670 U	770 U	830 U	280 UJ	570 U	1000 U	920 UJ	940 UL	750 U	700 U	700 U	920 UL	850 U	790 U	730 U	590 U	
Benzaldehyde	1400 UJ	470 U	790 U	520 UJ	530 U	410 U	400 U	920 UL	670 U	770 U	830 U	280 UJ	570 UJ	1000 U	920 U	940 UJ	750 U	700 U	700 U	920 UL	850 U	790 U	730 U	140 J	
Benz(a)anthracene	1400 U	470 U	790 U	520 UJ	530 U	410 U	400 U	920 UL	670 U	770 U	830 U	280 U	570 U	1000 U	920 U	940 UJ	750 U	700 U	700 U	920 UL	850 U	790 U	730 U	210 J	
Benz(a)pyrene	1400 U	470 U	300 J	520 UJ	530 U	410 U	400 U	290 L	670 U	180 J	190 J	280 U	570 U	1000 U	330 J	550 J	730 J	190 J	850	410 L	190 J	490 J	350 J		
Benz(b)Fluoranthene	1400 U	470 U	440 J	520 UJ	530 U	410 U	400 U	410 L	190 J	280 J	330 J	280 U	570 U	1000 U	460 J	730 J	1200	300 J	1500	680 L	330 J	700 J	700 J	810 K	
Benz(g,h,i)Perylene	1400 U	470 U	280 J	520 UJ	530 U	410 U	400 U	300 L	670 U	230 J	280 U	570 U	1000 U	350 J	590 J	880	700 U	870	920 UL	850 U	260 L	420 J	230 J		
Benz(k)Fluoranthene	1400 U	470 U	370 J	520 UJ	530 U	410 U	400 U	390 L	170 J	230 J	230 J	280 U	570 UJ	1000 U	450 J	680 J	820	230 J	890	470 L	220 J	640 J	430 J	870 K	
Bis(2-chloroethyl)Ether	1.4 U	0.64	7.9	2 UJ	2.1 U	410 U	400 U	920 UL	670 U	770 U	830 U	280 U	570 U	0.57 U	1.5	6.8	3.7 UJ	3 U	700 U	700 U	920 UL	850 U	790 U	730 U	590 U
Bis(2-ethylhexyl)phthalate	420 J	470 U	470 J	520 UJ	530 U	410 U	400 U	99 J	920 UL	230 J	230 J	320 J	280 U	570 U	1000 U	410 J	390 J	750 U	160 J	520 J	1200 UL	270 J	790 U	360 J	260 J
Caprolactam	1400 U	470 U	790 U	520 UJ	530 U	410 U	400 U	920 UL	670 U	770 U	830 U	280 U	570 U	1000 U	920 U	940 UJ	750 U	700 U	700 U	920 UL	850 U	790 U	730 U	590 U	
Di-n-butyl phthalate	1400 U	470 UL	790 U	520 UJ	530 U	410 U	400 U	920 UL	670 U	770 U	830 U	280 U	570 U	1000 UL	920 U	940 UJ	750 U	700 U	700 U	920 UL	850 U	790 U	730 U	590 U	
Di-n-octyl phthalate	1400 UJ	470 U	790 UJ	520 UJ	530 U	410 U	400 U	920 UL	670 U	770 U	830 U	280 U	570 UJ	1000 U	920 UJ	940 UJ	750 UL	700 U	700 UJ	920 UL	850 U	790 U	730 U	590 U	
Dibenzo(a,h)Anthracene	1400 U	470 U	790 U	520 UJ	530 U	410 U	400 U	920 UL	670 U	770 U	830 U	280 U	570 U	1000 U	920 U	940 UJ	200 J	700 U	330 J	920 UL	850 U	180 J	730 U	590 U	
Diethylphthalate	1400 U	470 U	790 U	520 UJ	530 U	410 U	400 U	920 UL	670 U	770 U	830 U	280 U	570 U	1000 U	920 U	940 UJ	750 U	700 U	700 U	920 UL	850 U	790 U	730 U	590 U	
Hexachlorocyclopentadiene	1400 UJ	470 U	790 U	520 UJ	530 U	410 U	400 U	920 UL	670 UL	770 UL	830 UL	280 R	570 UJ	1000 U	920 U	940 UJ	750 U	700 U	700 U	920 R	850 UL	790 UL	730 UL	590 R	
Indeno(1,2,3-cd)Pyrene	1400 U	470 U	290 J	520 UJ	530 U	410 U	400 U	330 L	160 J	240 J	240 J	280 U	570 U	1000 U	320 J	580 J	840	700 U	1100	430 L	240 J	630 J	460 J	310 J	
N-Nitrosodiphenylamine	1400 U	470 U	790 U	520 UJ	530 U	410 U	400 U	920 UL	670 U	770 U	830 U	280 U	570 U	1000 U	920 U	940 UJ	750 U	700 U	700 U	920 UL	850 U	790 U	730 U	590 U	
Naphthalene	1400 U	470 U	790 U	520 UJ	530 U	410 U	400 U	920 UL	670 U	770 U	830 U	280 U	570 U	1000 U	920 U	940 UJ	750 U	700 U	700 U	920 UL	850 U	790 U	730 U	590 U	
Pentachlorophenol	3600 U	1200 UL	2000 U	1300 UJ	1300 UL	1000 U	2300 U	1700 UL	1900 U	2100 UL	540 U	1400 U	2600 U	2300 U	2400 UJ	1900 U	1800 U	1800 U	2300 U	2100 UL	2000 U	1800 UL	1100 U		
Phenol	1400 U	470 U	790 U	520 UJ	530 U	410 U	400 U	920 UL	670 U	770 U	830 U	280 U	570 U	1000 U	920 U	940 UJ	750 U	700 U	700 U	920 UL	850 U	790 U	730 U	590 U	
Chrysene	1400 U	470 U	790 U	520 UJ	530 U	410 U	400 U	420 L	180 J	240 J	270 J	49 J	570 U	1000 U	920 U	680 J	990	240 J	1100	610 L	300 J	590 J	520 J	450 J	
Fluoranthene	1400 U	470 U	790 U	520 UJ	530 U	410 U	400 U	590 L	200 J	350 J	340 J	56 J	570 U	1000 U	920 U	1000 J	1400	360 J	1400	920 L	380 J	980	740	540 J	
Phenanthrene	1400 U	470 U	790 U	520 UJ	530 U	410 U	400 U	920 UL	670 U	770 U	830 U	280 U	570 U	1000 U	920 U	940 UJ	410 J	700 U	440 J	260 L	850 U	310 J	200 J	210 J	
Carbazole	1400 U	470 U	790 U	520 UJ	530 U	410 U	400 U	920 UL	670 UL	770 U	830 U	280 U	570 U	1000 U	920 U	940 UJ	750 U	700 U	700 U	920 UL	850 UL	790 U	730 U	590 U	
Pyrene	1400 U	470 U	790 U	520 UJ	530 U	410 U	400 U	490 L	260 J	240 J	300 J	280 U	570 U	1000 U	920 U	800 J	1400	260 J	1200	740 L	420 J	640 J	630 J	590 U	

U - Analyte was not detected above the reporting limit.

J - Estimated concentration.

-- Not analyzed

UL - Not detected, quantitation limit is probably higher

K - Analyte present. May be biased High.

L - Analyte present. May be biased low

R - Data Rejected

**Table 4 (continued)**  
Summary of Sediment Data for Army Creek and Army Pond

Parameter	SEDC												SEDD												
	10/04	1/05	4/05	7/05	10/05	1/06	4/06	7/06	10/06	1/07	4/07	10/09	10/04	1/05	4/05	7/05	10/05	1/06	4/06	7/06	10/06	1/07	4/07	10/09	
<b>Inorganics (mg/kg)</b>																									
Aluminum	15800	13600	16800	10600 J	6420	13500	5080	18500	16400	14700	19500	4740 J	15800	28400	26900	24000 J	22600	24700	27300	16300	20500	17300	16700	15100 J	
Antimony	1.6 U	1 J	1.5 UL	1.1 UJ	0.51 UJ	0.28 UJ	0.27 R	2.3 UJ	0.90 UJ	0.74 UL	1 R	0.27 UL	0.65 U	1.7 J	2 UL	1.4 UJ	1.4 J	0.95 L	2.5 UJ	1.2 UJ	1.1 L	0.96 R	0.60 UL		
Arsenic	13.1	4.1	3.7	1.8 J	0.85	3.7	0.39 U	6.2	3.8	4.8	6.7 L	1.2 U	7.9	11.8	9.9	11.5 J	10.7	8.1	11.0	9.4	10.8	10.6	10.6 L	8.6	
Barium	140	91.7	81.6	66.4 J	35	68.5	20.3	143	107	121	147	37.5	119	194	165	170 J	183	196	176	127	159	152	144	145	
Beryllium	1	0.54	0.58 U	0.52 J	0.2	0.57	0.34	1.1	1.0 U	0.72	1.2	0.31 J	1	1.4	1.2 U	1.4 J	0.81	1.1	1.6	1.2	1.5 U	1.0	1.2	1.3 J	
Cadmium	2.2	0.56	0.98 U	0.3 J	0.064 U	0.047 U	0.048 U	0.20 U	0.95 U	0.55	0.20 U	0.80 U	0.44	2.7	2.9 U	1.5 J	1	0.57	0.7	0.31 U	1.9 U	0.87	1.4	0.29 J	
Calcium	3180	872	946 J	1200 J	657	163	221	2340 J	1310 J	2490 J	1480	742 J	889	2000	2420 J	4310 J	3560	2370	3200	1470 J	2200 J	2680 J	2370	1620 J	
Chromium	24.9	19.3 J	17.6	14.9 J	8.7	16.3	6.8	29.0	24.3	30.3	9.5 J	19.1	42.4 J	39.4	38.6 J	37.1	34.4	41.7	27.8	33.8	30.7	30.9	27.5 J		
Cobalt	30.3	11.3 J	16.3	7.4 J	4.3	5.4	1.9	17.9 J	20.6	14.1	14	4.5 J	14.7	36.8 J	18.6	17.3 J	19.3	14.6	17.6	15.4 J	20.1	14.7	12.7	13.4 J	
Copper	40.9	15.2	11.4	10.9 J	5.9	6.5	2.7	34.4	26.2	23.2	31.6	6.9 J	14.5	42.8	40.1	40.5 J	36.6	27.8	40.5	37.6	43.4	36.3	42.2	37.8 J	
Iron	30500	22600 J	24200	13200 J	8660	14700	5910	33400	25300	25000	36600 J	8470 J	20900	46500 J	39500	41400 J	38800	38200	41500	30100	32500	36900	30400 J	27800 J	
Lead	90.6	57 J	26.2 J	23.5 J	11.8	10.2	4.3	79.3 J	57.0	49.7	74.3 K	12.6 K	32.2	152 J	97.6 J	110 J	89.9	87.3	105	88.3 J	111	84.8	92.7 K	85.8 K	
Magnesium	1780	1100 J	819	1050 J	594	1440	416	2220 J	1620 J	1760 J	2050	559 J	1620	2840 J	2820	2950 J	3110	2870	3490	2000 J	2520 J	2410 J	2310	1920	
Manganese	671	157 J	150 K	126 J	64.8 J	61.4	42.3 L	374 J	199 J	232 L	210	131 J	355	404 J	442 K	636 J	1390 J	568	867 L	300 J	373 J	569 L	368	270 J	
Mercury	0.21 U	0.074 UU	0.095 U	0.063 UU	0.067 U	0.060 U	0.049 U	0.14 U	0.10 U	0.080 U	0.28	0.17 U	0.2 U	0.14 UU	0.13 U	0.12 J	0.15	0.092 U	0.17	0.14 U	0.13	0.18	0.22	0.34 U	
Nickel	25.4	11.7	12.6	12.6 J	9	8.8 J	5.1	24.6	23.4	24.5 J	22.2 J	9.3	14.8	34.2	30.4	31.8 J	31.2	24.7 J	33.4	24.2	28.6	26.3 J	27.0 J	22.7	
Potassium	939	649	605	493 J	319	445 J	216	690 J	661 J	600 J	603 J	198 J	557	1200	1180	1220 J	1330 UU	1830 J	1530	671 J	985 J	806 J	661 J	697 J	
Selenium	2.1	1.1 UJ	0.91 UL	1.3 UJ	1.4 UJ	0.78 U	0.44 UL	1.1 UJ	0.94 U	1.0 L	1.3 UL	1.0 J	0.85 U	2.4 UJ	2.6 UL	2.5 UJ	2 UJ	2.4	0.75 UL	1.2 UJ	1.3 U	0.98 UL	2.1 L	2.9 J	
Silver	0.56 U	0.19 U	0.55 U	0.37 UU	0.064 U	0.12 U	0.12 U	0.15 U	0.19 U	0.21 U	0.60 U	1.6 U	0.23 U	0.42 U	0.75 U	0.71 UU	0.091 U	0.20 U	0.21 U	0.17 U	0.26 U	0.19 U	0.54 U	3.3 U	
Sodium	366	111	94.2 U	67.9 UJ	86.3	71.3 U	40.4 U	293 U	166	142 U	162 U	191 J	210 U	254	476 U	221 J	194	176 U	209	344 U	260	178 U	447	410 J	
Thallium	1.5 U	1.7 U	3.4	1.1 UJ	1.4 UJ	0.92 U	0.51 U	1.8 U	1.2 U	1.5 U	1.4 U	4.0 U	0.62 U	3.8 U	4.9	2.2 UJ	2.1 UJ	1.6 U	0.87 U	2.0 U	1.6 U	1.6 U	1.8 U	8.2 U	
Vanadium	59.3	43.9	33	21.4 J	13.8	27.6	9.6	44.7	36.3	35.6	46.5	12.6 J	31.9	79.8	61.4	63.7 J	60.1	60.2	66.7	53.3	59.2	50.4	53.0	49.5 J	
Zinc	398	42.6	64.3 J	74.7 J	32.1	25.2	10.2	258 J	176	163	131	36.2 J	117	310	330 J	283 J	272	158	294	282 J	313	270	335	232 J	
<b>Pesticides/Herbicides (µg/kg)</b>																									
4,4'-DDD	14 U	4.7 U	7.9 U	5.2 UJ	5.3 U	4.1 U	--	--	--	--	--	5.4 U	5.7 U	10 U	2.5 J	9.4 UJ	7.5 U	7.0 U	--	--	--	--	--	--	5.6 J
4,4'-DDE	14 U	14 J	7.9 U	5.2 UJ	5.3 U	4.1 U	--	--	--	--	--	5.4 U	5.7 U	10 U	9.2 U	3.3 J	7.5 U	2.6 J	--	--	--	--	--	--	7.2 J
4,4'-DDT	14 U	4.7 U	7.9 U	5.2 UJ	5.3 U	4.1 U	--	--	--	--	--	5.4 U	5.7 U	8.4 J	2.8 J	9.4 UJ	7.5 U	7.0 U	--	--	--	--	--	--	11 U
Aldrin	7.4 U	24 U	4 U	2.7 UJ	2.7 U	2.1 U	--	--	--	--	--	2.8 U	2.9 U	1.7 J	4.7 U	4.9 UJ	3.9 U	3.6 U	--	--	--	--	--	--	1.8 J
alpha-BHC	7.4 U	24 U	4 U	2.7 UJ	2.7 U	2.1 U	--	--	--	--	--	2.8 U	2.9 U	5.3 U	4.7 U	4.9 UJ	3.9 U	3.6 U	--	--	--	--	--	--	5.9 U
Alpha-Chlordane	6 J	24 U	4.3 J	2.7 UJ	2.7 U	2.1 U	--	--	--	--	--	5.4 U	2.9 U	3 J	8.8 J	8.1 J	13 JN	3.2 U	--	--	--	--	--	--	7.3 JN
beta-BHC	7.4 U	24 U	4 U	2.7 UJ	2.7 U	2.1 U	--	--	--	--	--	2.8 U	2.9 U	5.3 U	4.7 U	9.1 JN	3.9 U	3.6 U	--	--	--	--	--	--	5.9 U
delta-BHC	7.4 U	24 U	4 U	2.7 UJ	2.7 U	2.1 U	--	--	--	--	--	2.8 U	2.9 U	5.3 U	4.7 U	4.9 UJ	3.9 U	3.6 U	--	--	--	--	--	--	5.9 U
Dielein	14 U	47 U	7.9 U	5.2 UJ	5.3 U	4.1 U	--	--	--	--	--	5.4 U	5.7 U	7.2 J	3.7 J	3.7 J	11 J	7.0 U	--	--	--	--	--	--	4.8 J
Endosulfan I	7.4 U	24 U	4 U	2.7 UJ	2.7 U	2.1 U	--	--	--	--	--	2.8 U	2.9 U	5.3 U	4.7 U	4.9 UJ	3.9 U	3.6 U	--	--	--	--	--	--	5.9 U
Endosulfan II	14 U	47 U	7.9 U	5.2 UJ	5.3 U	4.1 U	--	--	--	--	--	5.4 U	5.7 U	10 U	9.2 U	9.4 UJ	7.5 U	7.0 U	--	--	--	--	--	--	11 U
Endosulfan sulfate	14 U	47 U	7.9 U	5.2 UJ	5.3 U	4.1 U	--	--	--	--	--	5.4 U	5.7 U	10 U	9.2 U	9.4 UJ	7.5 U	7.0 U	--	--	--	--	--	--	11 U
Endrin	14 U	47 U	7.9 U	5.2 UJ	5.3 U	4.1 U	--	--	--	--	--	5.4 U	5.7 U	7.9 J	9.2 U	9.4 UJ	7.5 U	7.0 U	--	--	--	--	--	--	11 U
Endrin Aldehyde	14 U	4.7 U	7.9 U	5.2 UJ	5.3 U	4.1 U	--	--	--	--	--	5.4 U	5.7 U	10 U	9.2 U	9.4 UJ	7.5 U	3.3 J	--	--	--	--	--	--	11 U
Endrin Ketone	3.4 J	4.7 U	3.2 J	5.2 UJ	5.3 U	4.1 U	--	--	--	--	--	5.4 U	5.7 U	10 U	9.2 U	9.4 UJ	7.7 JN	7.0 U	--	--	--	--	--	--	11 U
gamma-BHC (Lindane)	7.4 U	24 U	4 U	2.7 UJ	2.7 U	2.1 U	--	--	--	--	--	2.8 U	2.9 U	4.1 J	4.7 U	4.9 UJ	3.9 U	3.6 U	--	--	--	--	--	--	5.9 U
gamma-Chlordane	7.4 U	24 U	4 U	2.7 UJ	2.7 U	2.1 U	--	--	--	--	--	2.8 U	2.9 U	2.1 J	5.4 JN	4.9 UJ	6.1 J	2.2 J	--	--	--	--	--	--	8.4
Heptachlor	7.4 U	24 U	4 U	2.7 UJ	2.7 U	2.1 U	--	--	--	--	--	2.8 U	2.9 U	3.8 J	4.7 U	4.9 UJ	3.9 U	3.6 U	--	--	--	--	--	--	5.9 U
Heptachlor Epoxide	7.4 U	24 U	4 U	2.7 UJ	2.7 U	2.1 U	--	--	--	--	--	2.8 U	2.9 U	5.3 U	2.6 JN	4.9 UJ	3.9 U	3.6 U	--	--	--	--	--	--	5.9 U
Methoxychlor	74 U	24 U	40 U	27 UJ	27 U	21 U	--	--	--	--	--	28 U	29 U	53 U	47 U	49 UJ	12 J	36 U	--	--	--	--	--	--	59 U
Toxaphene	--	--	--	270 UJ	270 U	210 U	--	--	--	--	--	280 U	--	--	490 UJ	390 U	360 U	--	--	--	--	--	--	--	590 U

U - Analyte was not detected above the reporting limit.

J - Estimated concentration.

-- Not analyzed.

N - Analysis indicates the presence of an analyte for which there is presumptive evidence to make a "tentative identification"

D - Sample diluted in the lab for analysis.

K - Analyte present. May be biased High.

L - Analyte present. May be biased low

R - Data Rejected

P - Discrepancy in GC analysis. Lower value reported.

S - Sample spike recovery is outside of control limits

**Table 4 (continued)**  
Summary of Sediment Data for Army Creek and Army Pond

Parameter	SEDE												SEDF											
	10/04	1/05	4/05	7/05	10/05	1/06	4/06	7/06	10/06	1/07	4/07	10/09	10/04	1/05	4/05	7/05	10/05	1/06	4/06	7/06	10/06	1/07	4/07	10/09
<b>Semi-Volatiles (µg/kg)</b>																								
1,1'-Biphenyl	690 U	630 U	750 UJ	690 UJ	1200 U	540 U	770 U	970 U	520 U	630 U	650 U	350 U	430 U	460 U	600 UJ	560 UJ	540 U	490 U	450 U	510 U	490 U	500 U	480 U	240 U
2,2'-oxybis(1-Chloropropane)	690 U	630 UL	750 UJ	690 UL	1200 U	540 U	770 U	970 U	520 U	630 U	650 U	350 U	430 U	460 UL	600 UJ	560 UL	540 U	490 U	450 U	510 U	490 U	500 U	480 U	240 U
2,4-Dimethylphenol	690 U	630 UL	750 U	690 U	1200 U	540 U	770 U	970 U	520 U	630 U	650 U	350 U	430 U	460 UL	600 U	560 UJ	540 U	490 U	450 U	510 U	490 U	500 U	480 U	240 U
2,4-Dinitrophenol	1700 UJ	1600 U	1900 UL	1700 UJ	3000 UL	1400 R	1900 UL	2400 R	1300 UL	1600 U	690 U	1100 UJ	1200 U	1500 UL	1400 UJ	1400 UL	1200 R	1100 UL	1300 R	1200 UL	1300 UL	1200 U	1200 U	460 U
2,6-Dinitrotoluene	690 U	630 U	750 U	690 U	1200 U	540 U	770 U	970 U	520 U	630 U	650 U	350 U	430 U	460 U	600 U	560 UJ	540 U	490 U	450 U	510 U	490 U	500 U	480 U	240 U
2-Methylnaphthalene	690 U	630 U	750 U	690 U	1200 U	540 U	770 U	970 U	520 U	630 U	650 U	350 U	430 U	460 U	600 U	560 UJ	540 U	490 U	450 U	510 U	490 U	500 U	480 U	240 U
2-Methylphenol	690 U	630 U	750 U	690 U	1200 U	540 U	770 U	970 U	520 U	630 U	650 U	350 U	430 U	460 U	600 U	560 UJ	540 U	490 U	450 U	510 U	490 U	500 U	480 U	240 U
4,6-Dinitro-2-methylphenol	1700 UJ	1600 UL	1900 U	1700 UJ	3000 U	1400 UL	1900 U	2400 UL	1300 U	1600 U	690 U	1100 UJ	1200 UL	1500 U	1400 UJ	1400 U	1200 UL	1100 U	1300 UL	1200 U	1300 UL	1200 U	1200 U	460 U
4-Methylphenol	690 U	630 U	750 U	690 UJ	1200 U	540 U	770 U	970 U	520 U	630 U	650 U	350 U	430 U	460 U	600 U	560 UJ	540 U	490 U	450 U	510 U	490 U	500 U	480 U	240 U
Acetophenone	690 U	630 U	750 U	690 UJ	1200 U	540 U	700 U	970 U	520 U	630 U	650 U	150 J	430 U	460 U	600 U	560 UJ	540 U	490 U	450 U	510 U	490 U	500 U	480 U	54 J
Atrazine	690 U	630 U	750 UJ	690 UL	1200 U	540 U	770 U	970 U	520 U	630 U	650 U	350 UJ	430 U	460 U	600 UJ	560 UL	540 U	490 U	450 U	510 U	490 U	500 U	480 U	240 UU
Benzaldehyde	690 UJ	630 U	750 U	690 UJ	1200 U	540 U	770 U	970 U	520 U	630 U	650 U	350 UJ	430 U	460 U	600 U	560 UJ	540 U	490 U	450 U	510 U	490 U	500 U	480 U	240 UU
Benzo (a) anthracene	690 U	630 U	750 U	420 J	710 J	540 U	680 J	770 J	520 U	300 J	410 J	470	430 U	460 U	600 U	120 J	270 J	130 J	110 J	510 U	490 U	120 J	480 U	240 U
Benzo (a) pyrene	180 J	630 U	630 J	750 J	1100 J	120 J	1200	1300	110 J	480 J	660	850	160 J	110 J	1600	180 J	490 J	190 J	170 J	510 U	490 U	190 J	480 U	240 UL
Benzo (b) Fluoranthene	220 J	630 U	860	1100 J	2100 J	170 J	1800	2000	160 J	830	890	2300 K	160 J	140 J	2300	220 J	760	270 J	220 J	110 J	490 U	310 J	100 J	240 UL
Benzo (g,h,i) Perylene	190 J	630 U	570 J	720 J	1400	540 U	1200	1200	130 J	370 L	640 J	510	100 J	460 U	1300	160 J	350 J	190 J	140 J	510 U	490 U	500 UL	480 U	240 UL
Benzo (k) Fluoranthene	200 J	630 U	770	850 J	1300 J	160 J	1500	1300	140 J	480 J	800	2500 K	190 J	140 J	1300	210 J	780	210 J	210 J	510 U	490 U	200 J	480 U	240 UL
Bis(2-chloroethyl)Ether	0.69 U	0.66	5.2	2.7 UU	4.6 U	540 U	770 U	970 U	520 U	630 U	650 U	350 U	0.43 U	1.2	5	2.2 UU	2.1 U	490 U	450 U	510 U	490 U	500 U	480 U	240 UU
Bis(2-ethylhexyl)phthalate	470 J	250 J	240 J	410 J	2300 U	120 J	750 J	1200 U	110 J	630 U	190 J	230 J	150 J	460 U	320 J	150 J	540 UL	490 U	200 J	510 U	490 U	500 U	480 U	240 U
Caprolactam	690 U	630 U	750 U	690 UJ	1200 U	540 U	770 U	970 U	520 U	630 U	650 U	350 U	430 U	460 U	600 U	560 UJ	540 U	490 U	450 U	510 U	490 U	500 U	480 U	240 U
Di-n-butyl phthalate	690 U	630 UL	750 U	690 UJ	1200 U	540 U	770 U	970 U	520 U	630 U	650 U	350 U	430 U	460 UL	600 U	560 UJ	540 U	490 U	450 U	510 U	490 U	500 U	480 U	240 U
Di-n-octyl phthalate	690 UJ	630 U	750 UJ	690 UJ	1200 U	540 U	770 UJ	970 U	520 U	630 U	650 U	350 U	430 U	460 U	600 UJ	560 UJ	540 UL	490 U	450 UJ	510 U	490 U	500 U	480 U	240 U
Dibenzo (a,h) Anthracene	690 U	630 U	750 U	180 J	280 J	540 U	470 J	450 J	520 U	130 J	190 J	220 J	430 U	460 U	330 J	560 UJ	540 U	490 U	450 U	510 U	490 U	500 U	480 U	240 UL
Diethylphthalate	690 U	630 U	750 U	690 UJ	1200 U	540 U	770 UJ	970 U	520 U	630 U	650 U	350 U	430 U	460 U	600 U	560 UJ	540 U	490 U	450 U	510 U	490 U	500 U	480 U	240 U
Hexachlorocyclopentadiene	690 UJ	630 U	750 U	690 UJ	1200 U	540 U	770 U	970 U	520 UL	630 UL	650 UL	350 R	430 UJ	460 U	600 U	560 UJ	540 U	490 U	450 U	510 UL	490 UL	500 UL	480 UL	240 R
Indeno (1,2,3-cd) Pyrene	200 J	630 U	560 J	730 J	1300	110 J	1500	130 J	390 J	720	760	160 J	100 J	1300	160 J	360 J	200 J	180 J	510 U	490 U	220 J	480 U	240 R	
N-Nitrosodiphenylamine	690 U	630 U	750 U	690 UJ	1200 U	540 U	770 U	970 U	520 U	630 U	650 U	350 U	430 U	460 U	600 U	560 UJ	540 U	490 U	450 U	510 U	490 U	500 U	480 U	240 U
Naphthalene	690 U	630 U	750 U	690 UJ	1200 U	540 U	770 U	970 U	520 U	630 U	650 U	350 U	430 U	460 U	600 U	560 UJ	540 U	490 U	450 U	510 U	490 U	500 U	480 U	240 U
Pentachlorophenol	1700 U	1600 U	1900 U	1700 U	3000 U	1400 U	1900 U	2400 UL	1300 UL	1600 U	690 U	1100 U	1200 U	1500 U	1400 U	1400 U	1200 U	1100 U	1300 UL	1200 UL	1300 U	1200 UL	460 U	
Phenol	690 U	630 U	750 U	690 UJ	1200 U	540 U	770 U	970 U	520 U	630 U	650 U	350 U	430 U	460 U	600 U	560 UJ	540 U	490 U	450 U	510 U	490 U	500 U	480 U	240 U
Chrysene	690 U	630 U	750 U	940 J	1800 J	140 J	1500	1700	150 J	660	780	1100	430 U	460 U	600 U	250 J	610	260 J	220 J	110 J	490 U	250 J	110 J	240 U
Fluoranthene	690 U	630 U	750 U	1400 J	2100	230 J	2000	2600	200 J	1200	1200	430 U	460 U	600 U	360 J	840	340 J	300 J	130 J	100 J	390 J	130 J	240 U	
Phenanthrene	690 U	630 U	750 U	420 J	670 J	540 U	680 J	850 J	520 U	370 J	370 J	380	430 U	460 U	600 U	130 J	260 J	100 J	510 U	490 U	120 J	480 U	240 U	
Carbazole	690 U	630 U	750 U	690 UJ	1200 U	540 U	180 J	970 U	520 UL	630 U	650 U	350 U	430 U	460 U	600 U	560 UJ	540 U	490 U	450 U	510 UL	490 UL	500 U	480 U	240 U
Pyrene	690 U	630 U	750 U	1100 J	2300	180 J	1800	2100	710	980	1200	430 U	460 U	600 U	310 J	680	280 J	250 J	140 J	260 J	140 J	240 U		

UL - Not detected, quantitation limit is probably higher

K - Analyte was not detected above the reporting limit.

J - Estimated concentration.

L - Analyte present. May be biased High.

-- Not analyzed

R - Data Rejected

**Table 4 (continued)**  
Summary of Sediment Data for Army Creek and Army Pond

Parameter	SEDE												SEDF												
	10/04	1/05	4/05	7/05	10/05	1/06	4/06	7/06	10/06	1/07	4/07	10/09	10/04	1/05	4/05	7/05	10/05	1/06	4/06	7/06	10/06	1/07	4/07	10/09	
<b>Inorganics (mg/kg)</b>																									
Aluminum	22000	22500	22700	20700 J	14100	13000	20500	21700	11000	27400	14900	14300 J	2970	2950	8270	17000 J	19500	15700	9280	17900	18300	10200	16700	9660 J	
Antimony	0.78 U	1.2 J	1.6 UL	1.5 UJ	1.8 UJ	1 J	0.66 L	2.3 UJ	0.67 UJ	0.82 L	0.78 R	12.6 UL	0.49 U	0.64 UJ	1.3 UL	1.2 UJ	1.1 UJ	1.3 J	0.38 L	1.7 UJ	1 UJ	0.51 UL	0.61 R	8.3 UL	
Arsenic	7.7	7.8	10.4	11 J	7.4	6.1	8.3	9.7	4.3	8.7	8.4 L	9.0	1.8	2.4	4.7	5.6 J	6.2	6.5	2.9	9.6	7.3	4.1	8.9 L	4.0	
Barium	127	142	167	164 J	170	106	164	190	91.1	189	146	143	21.2	35.8	66.1	110 J	114	99.1	60.4	179	108	73.8	143	76.8	
Beryllium	1.1	0.9	1.1 U	1.1 J	0.57	0.75	1.3	1.5	0.89 U	1.3	0.96	1.1	0.22	0.2	0.41 U	1.1 J	0.65	0.87	0.59	1.3	1.1 U	0.56 U	1.1	0.73	
Cadmium	1.1	1.6	2.6 U	1.3 J	0.92	0.2	0.57	0.37 U	0.43 U	0.91	0.5	1.1 U	0.3	0.31	0.97 U	0.36 J	0.22	0.18	0.13	0.12 U	0.73 U	0.089 U	0.12 U	0.69 U	
Calcium	1300	1420	1700 J	2510 J	9540	2050	3690	2560 J	2250 J	2120 J	3090	2180 J	9.4	533	3510 J	1380 J	2410	1410	766	1450 J	1570 J	1000 J	934	737 J	
Chromium	35.8	36 J	40.2	37.2 J	26.2	19.6	36.0	45.5	17.9	42.8	29.7	29.4 J	6.7	5.8 J	17.7	24.4 J	31.2	24.9	14.3	26.3	26.9	18.7	25.5	15.3 J	
Cobalt	10.1	10.6 J	10.6 U	14.6 J	14.6	10.6	13	17.0 J	6.9	20.8	10.9	13.3	1.7	1.9 J	5.3 U	9.2 J	9.7	9.7	5.1	7.4 J	9.7	6.1	9.1	5.2 J	
Copper	31.5	32.1	40.5	37.6 J	32.2	16.4	36.3	52.3	18.4	39.0	33.2	35.2 J	7.7	4.8	14.8	19.1 J	28.5	19.6	11.5	32.6	24.6	17.0	32.5	15.1 J	
Iron	25500	27500 J	40000	38500 J	29800	19100	34800	37700	16800	36000	31300 J	38100 J	5650	8530 J	18400	23700 J	25400	25400	15500	35700	27800	18400	29000 J	16500 J	
Lead	80	80.8 J	84.3 J	74.4 J	59.6	74.7	66.5	94.9 J	54.0	101	61.0 K	58.8 K	14.8	10.8 J	29.7 J	68.7 J	102	97.6	42.3	151 J	132	66.0	175 K	66.4 K	
Magnesium	2910	2650 J	2810	2700 J	2190	3100	3360 J	1500 J	3400 J	2390	2200	514	502 J	1520	1880 J	2680	2110	1170	2040 J	2300 J	1450 J	2110	1180		
Manganese	199	262 J	426 K	835 J	2570 J	310	1100 L	544 J	210 J	467 L	1260	748 J	51.2	76.5 J	542 K	242 J	305 J	434	196 L	176 J	489 J	185 L	328	153 J	
Mercury	0.1 U	0.18 UU	0.14	0.1 J	0.14 U	0.12	0.12	0.15 U	0.074 U	0.14	0.11 U	0.21 U	0.065 U	0.055 UU	0.093 U	0.66 UJ	0.12	0.095	0.068 U	0.11	0.082	0.12	0.20	0.14 U	
Nickel	35.3	24.1	30.4	30.7 J	22.5	16 J	28.1	37.6	14.6	29.2 J	24.2 J	23.5	6.3	4.4	13.1	17.3 J	22.7	17.8 J	10.3	17.5	18.9	13.0 J	17.8 J	9.5	
Potassium	950	1220	1070	957 J	1380	751 J	1100	1030 J	706 J	1350 J	519 J	348 J	128	209	423	802 J	1020	829 J	517	597 J	1160 J	604 J	727 J	541 J	
Selenium	1.4	1.4 UU	1.1 UL	1.8 UU	3 UJ	2.0	0.81 L	1.3 UJ	0.76 U	0.79 UL	1.0 UL	2.4 J	0.74	1 UJ	0.81 UL	1.4 UU	1.3 UU	1.5	0.47 UL	0.66 UU	0.98 U	0.62 UL	1.1 L	1.1 J	
Silver	0.27 U	0.25U	0.6 U	0.52 UJ	0.14 U	0.15 U	0.23 U	0.17 U	0.15 U	0.15 U	0.45 U	2.1 U	0.17 U	0.18 U	0.49 U	0.41 UU	0.062 U	0.14 U	0.13 U	0.089 U	0.14 U	0.12 U	0.35 U	1.4 U	
Sodium	254	197	229 U	200 J	415	111 U	297	392 U	283	195 U	287	487 J	159 U	94.1	142 U	127 J	181	116 U	138 U	215 U	272	127 U	155 U	247 J	
Thallium	0.74 U	2.2 U	6.7	1.6 UU	3.2 UJ	1.2 U	0.95 U	2.1 U	0.98 U	1.3 U	1.1 U	5.3 U	0.47 U	1.6 U	1.8	1.3 UU	1.4 UU	1.1 U	0.55 U	1.1 U	0.87 U	1.0 U	1.4 U	3.5 U	
Vanadium	54.8	56.5	58.9	55.1 J	40.8	42.9	53.2	67.8	33.4	68.7	46.4	48.0 J	9.9	8.8	24.1	39 J	51.6	48.2	22.9	52.2	55.5	36.1	59.3	34.3 J	
Zinc	212	229	307 J	295 J	272	80.2	272	456 J	92.8	290	254	222 J	70.6	69.4	137 J	125 J	173	116	93.0	128 J	126	91.7	140	56.4 J	
<b>Pesticides/Herbicides (µg/kg)</b>																									
4,4'-DDD	6.9 U	6.3 U	7.5 U	6.9 UJ	2.9 JP	5.4 U	--	--	--	--	2.9 J	4.3 U	4.6 U	6 U	1.6 J	5.4 U	2.5 U	--	--	--	--	--	--	--	5.7
4,4'-DDE	6.9 U	6.3 U	7.5 U	6.9 UJ	12 U	12	--	--	--	--	1.9 JN	4.3 U	4.6 U	6 U	2.6 J	5.4 U	15	--	--	--	--	--	--	--	27
4,4'-DDT	6.9 U	6.3 U	7.5 U	6.9 UJ	4.1 JP	8.7 J	--	--	--	--	5.3 J	4.3 U	4.6 U	6 U	5.6 UJ	5.4 U	8.5 J	--	--	--	--	--	--	--	8.6 J
Aldrin	3.5 U	3.3 U	2.6 JN	4.4 J	6.1 U	2.8 U	--	--	--	--	1.4 J	2.2 U	2.4 U	3.1 U	2.9 UJ	2.8 U	2.5 U	--	--	--	--	--	--	--	2.4 U
alpha-BHC	3.5 U	3.3 U	3.9 U	3.5 UJ	6.1 U	2.8 U	--	--	--	--	3.5 U	2.2 U	2.4 U	3.1 U	2.9 UJ	2.8 U	2.5 U	--	--	--	--	--	--	--	2.4 U
Alpha-Chlordane	4.5	3 J	9.7	15 J	22 JP	2.8 U	--	--	--	--	11 J	2.4	1.7 J	8.1	2.9 UJ	3.9 JN	2.5 U	--	--	--	--	--	--	--	4.6 U
beta-BHC	3.5 U	3.3 U	3.9 U	6.9 U	6.1 U	2.8 U	--	--	--	--	3.5 U	2.2 U	2.9 JN	3.1 U	5.3 J	2.8 U	2.5 U	--	--	--	--	--	--	--	2.4 U
delta-BHC	3.5 U	3.3 U	3.9 U	3.5 UJ	6.1 U	2.8 U	--	--	--	--	3.5 U	2.2 U	2.4 U	3.1 U	2.9 UJ	2.8 U	2.5 U	--	--	--	--	--	--	--	2.4 U
Dieldrin	6.9 U	6.3 U	2.4 J	4.9 J	12 U	5.4 U	--	--	--	--	6.2 J	4.3 U	1.4 J	5.6 J	2.7 J	5.4 U	4.9 U	--	--	--	--	--	--	--	2.4 U
Endosulfan I	3.5 U	3.3 U	3.9 U	3.5 UJ	6.1 U	2.8 U	--	--	--	--	3.5 U	2.2 U	2.4 U	3.1 U	2.9 UJ	2.8 U	2.5 U	--	--	--	--	--	--	--	2.4 U
Endosulfan II	6.9 U	6.3 U	7.5 U	6.9 UJ	12 U	5.4 U	--	--	--	--	6.9 U	4.3 U	4.6 U	6 U	5.6 UJ	5.4 U	4.9 U	--	--	--	--	--	--	--	4.6 U
Endosulfan sulfate	6.9 U	6.3 U	7.5 U	6.9 UJ	12 U	5.4 U	--	--	--	--	6.9 U	4.3 U	4.6 U	6 U	5.6 UJ	2.4 J	4.9 U	--	--	--	--	--	--	--	4.6 U
Endrin	6.9 U	6.3 U	7.5 U	6.9 UJ	12 U	5.4 U	--	--	--	--	6.9 U	4.3 U	4.6 U	6 U	5.6 UJ	5.4 U	4.9 U	--	--	--	--	--	--	--	4.6 U
Endrin Aldehyde	6.9 U	6.3 U	7.5 U	6.9 UJ	12 U	5.4 U	--	--	--	--	6.9 U	4.3 U	4.6 U	6 U	5.6 UJ	5.4 U	5.3	--	--	--	--	--	--	--	4.6 U
Endrin Ketone	6.9 U	6.3 U	7.5 U	6.9 UJ	12 U	5.4 U	--	--	--	--	6.9 U	4.3 U	4.6 U	6 U	5.6 UJ	6.1 JN	1.5 J	--	--	--	--	--	--	--	4.6 U
gamma-BHC (Lindane)	3.5 U	3.3 U	3.9 U	3.5 UJ	6.1 U	2.8 U	--	--	--	--	3.5 U	2.2 U	2.4 U	3.1 U	2.9 UJ	2.8 U	2.5 U	--	--	--	--	--	--	--	2.4 U
gamma-Chlordane	3.5 U	3.3 U	4.2 JN	6.7 JN	6.8 JN	0.94 J	--	--	--	--	7.1	2.2 U	2.4 U	3.1 U	2.9 UJ	2.8 U	1.4 J	--	--	--	--	--	--	--	1.4 J
Heptachlor	3.5 U	3.3 U	3.9 U	3.5 UJ	6.1 U	2.8 U	--	--	--	--	3.5 U	2.2 U	2.4 U	3.1 U	2.9 UJ	2.8 U	2.5 U	--	--	--	--	--	--	--	2.4 U
Heptachlor Epoxide	3.5 U	3.3 U	3.9 U	3.5 UJ	6.1 U	2.8 U	--	--	--	--	3.5 U	2.2 U	2.4 U	3.1 U	2.9 UJ	2.8 U	2.5 U	--	--	--	--	--	--	--	2.4 U
Methoxychlor	35 U	33 U	39 U	12 J	14 J	28 U	--	--	--	--	35 U	22 U	24 U	8.2 J	29 UJ	28 U	25 U	--	--	--	--	--	--	--	24 U
Toxaphene	--	--	--	350 UJ	610 U	280 U	--	--	--	--	350 U	--	--	290 UJ	280 U	250 U	--	--	--	--	--	--	--	240 U	

U - Analyte was not detected above the reporting limit.

J - Estimated concentration.

-- Not analyzed.

N - Analysis indicates the presence of an analyte for which there is presumptive evidence to make a "tentative identification"

D - Sample diluted in the lab for analysis.

K - Analyte present. May be biased High.

L - Analyte present. May be biased low

R - Data Rejected

P - Discrepancy in GC analysis. Lower value reported.

S - Sample spike recovery is outside of control limits

**Table 4 (continued)**  
Summary of Sediment Data for Army Creek and Army Pond

Parameter	SEDG											
	10/04	1/05	4/05	7/05	10/05	1/06	4/06	7/06	10/06	1/07	4/07	10/09
<b>Semi-Volatiles (µg/kg)</b>												
1,1'-Biphenyl	550 U	520 U	1100 UJ	800 UJ	1100 U	490 U	690 U	940 U	610 U	630 U	520 U	220 U
2,2'-oxybis (1-Chloropropane)	550 U	520 UL	1100 UJ	800 UL	1100 U	490 U	690 U	940 U	610 U	630 U	520 U	220 U
2,4-Dimethylphenol	550 U	520 UL	1100 U	800 UJ	1100 U	490 U	690 U	940 U	610 U	630 U	520 U	220 U
2,4-Dinitrophenol	1400 UJ	1300 U	2900 UL	2000 UJ	2700 UL	1200 UL	1700 UL	2400 R	1500 UL	1600 UL	1300 U	430 U
2,6-Dinitrotoluene	550 U	520 U	1100 U	800 UJ	1100 U	490 U	690 U	940 U	610 U	630 U	520 U	220 U
2-Methylnaphthalene	550 U	520 U	1100 UJ	800 UJ	1100 U	490 U	690 U	940 U	610 U	630 U	520 U	220 U
2-Methylphenol	550 U	520 U	1100 U	800 UJ	1100 U	490 U	690 U	940 U	610 U	630 U	520 U	220 U
4,6-Dinitro-2-methylphenol	1400 UJ	1300 UL	2900 U	2000 UJ	2700 U	1200 UL	1700 U	2400 UL	1500 U	1600 UL	1300 U	430 U
4-Methylphenol	550 U	520 U	1100 U	800 UJ	1100 U	490 U	690 U	940 U	610 U	630 U	520 U	220 U
Acetophenone	550 U	520 U	1100 U	800 UJ	1100 U	490 U	690 U	940 U	610 U	630 U	520 U	180 J
Anthracene	550 U	520 U	1100 U	800 UJ	1100 U	490 U	690 U	940 U	610 U	630 U	200 L	75 J
Atrazine	550 U	520 U	1100 UJ	800 UL	1100 U	490 UL	690 U	940 U	610 U	630 U	520 U	220 UJ
Benzaldehyde	550 UJ	520 U	1100 U	800 UJ	1100 U	490 UL	690 U	940 U	610 U	630 U	520 U	220 UJ
Benzo (a) anthracene	550 U	520 U	1100 U	690 J	1200	120 J	2000	1200	810	700	1400	430
Benzo (a) pyrene	350 J	520 U	2200	1000 J	1500	160 J	2600	1600	1100	990	1600	460
Benzo (b) Fluoranthene	380 J	520 U	2600	1300 J	2300	220 J	4200	2100	1700	1300	1900	870 K
Benzo (g,h,i) Perylene	300 J	520 U	1600	890 J	870 J	100 J	1700	1300	570 J	500 L	1100	250
Benzo (k) Fluoranthene	400 J	520 U	2100	1000 J	1800	160 J	2900	1900	1200	1100	1700	920 K
Bis(2-chloroethyl)Ether	0.56 U	0.53 U	0.57 U	3.2 UJ	4.2 U	490 U	690 U	940 U	610 U	630 U	520 U	220 U
Bis(2-ethylhexyl)phthalate	190 J	520 U	1700 J	780 J	1700 U	490 U	1100	1300 U	400 J	630 U	810	220 U
Caprolactam	550 U	520 U	1100 U	800 UJ	1100 U	490 U	690 U	940 U	610 U	630 U	520 U	220 U
Di-n-butyl phthalate	550 U	520 UL	1100 U	800 UJ	1100 U	490 U	690 U	940 U	610 U	630 U	520 U	220 U
Di-n-octyl phthalate	550 UJ	520 U	1100 UJ	800 UJ	1100 U	490 U	690 UJ	940 U	610 U	630 U	520 U	220 U
Dibenzo (a,h) Anthracene	550 U	520 U	410 J	230 J	220 J	490 U	820	490 J	250 J	220 J	390 J	91 J
Diethylphthalate	550 U	520 U	1100 U	800 UJ	1100 U	490 U	690 UJ	940 U	610 U	630 U	520 U	220 U
Hexachlorocyclopentadiene	550 UJ	520 U	1100 U	800 UJ	1100 U	490 U	690 U	940 UL	610 UL	630 UL	520 UL	220 R
Indeno (1,2,3-cd) Pyrene	360 J	520 U	1700	870 J	910 J	120 J	2400	1500	940	980	1300	360
N-Nitrosodiphenylamine	550 U	520 U	1100 U	800 UJ	1100 U	490 U	690 U	940 U	610 U	630 U	520 U	220 U
Naphthalene	550 U	520 U	1100 U	800 UJ	1100 U	490 U	690 U	940 U	610 U	630 U	520 U	220 U
Pentachlorophenol	1400 U	1300 U	2900 U	2000 UJ	2700 UL	1200 U	1700 U	2400 UL	1500 UL	1600 U	1300 UL	430 U
Phenol	550 U	520 U	1100 U	800 UJ	1100 U	490 U	690 U	940 U	610 U	630 U	520 U	220 U
Chrysne	550 U	520 U	1100 U	1300 J	1900	180 J	3200	2200	1400	1200	1900	620
Fluoranthene	550 U	520 U	1100 U	2100 J	3100	320 J	4600	3300	2000	2100	3200	1000
Phenanthrene	550 U	520 U	1100 U	760 J	1100	110 J	1500	1200	720	690	1200	450
Carbazole	550 U	520 U	1100 U	800 UJ	1100 U	490 U	350 J	230 L	610 UL	630 U	180 J	220 U
Pyrene	550 U	520 U	1100 U	1600 J	3100	250 J	4000	2700	2000	1400	2600	910

U - Analyte was not detected above the reporting limit.

K - Analyte present. May be biased High.

J - Estimated concentration.

L - Analyte present. May be biased low

-- Not analyzed.

R - Data Rejected

UL - Not detected, quantitation limit is probably higher

**Table 4 (continued)**  
Summary of Sediment Data for Army Creek and Army Pond

Parameter	SEDG											
	10/04	1/05	4/05	7/05	10/05	1/06	4/06	7/06	10/06	1/07	4/07	10/09
<b>Inorganics (mg/kg)</b>												
Aluminum	10900	9240	8000	21000 J	19000	5950	19600	11800	16100	14200	5680	1100 J
Antimony	0.61 U	0.87 J	1.2 UL	1.8 UJ	2 UJ	0.5 J	0.69 L	2.0 UJ	1.3 UJ	0.99 L	0.73 R	10.7 UL
Arsenic	5.4	3.7	4.3	8.2 J	8.9	2.2	5.8	5.4	7.6	7.4	2.9 L	0.38 U
Barium	89.3	82.3	70.2	171 J	193	55.5	169	135	156	146	50.7	10.9 J
Beryllium	0.64	0.58	0.39 U	1.2 J	0.71	0.41	1.2	0.91 U	1.0 U	0.95	0.39 U	0.17 J
Cadmium	0.64	0.56	0.96 U	1.3 J	1	0.14	0.70	0.23 U	1.2 U	0.5	0.4	0.89 U
Calcium	3110	1660	4700 J	4160 J	5430	2580	3980	4890 J	4030 J	4080 J	1980	2490 J
Chromium	23.3	16.4 J	18.3	39.1 J	39.6	10.5	34.5	25.7	32.8	28.2	15.4	5.1 J
Cobalt	6.7	3.2 J	4.8 U	11.8 J	11.9	2.8	11.3	11.5 J	11.7	12.1	4	0.98 J
Copper	23.9	13.2	20.5	41.7 J	49.7	8.6	160	32.6	37.9	33.7	15.4	5.7 J
Iron	20200	11700 J	15500	30900 J	34200	8860	28100	25100	29100	27200	12300 J	4290 J
Lead	61.3	73.2 J	42.5 J	101 J	113	27.1	90.5	58.7 J	72.1	70.5	62.3 K	27.1 K
Magnesium	2340	1260 J	1750	3530 J	3540	995	3420	2200 J	2930 J	2470 J	1570	1450
Manganese	635	110 J	371 K	402 J	566 J	149	934 L	505 J	1240 J	559 L	284	26.9 J
Mercury	0.2 U	0.15 UJ	0.086	0.12 UJ	0.16	0.067 U	0.14	0.14 U	0.089	0.13	0.19	0.18 U
Nickel	18.6	10	14.3	32.5 J	33	6.9 J	29.7	21.8	27.4	23.3 J	11.2 J	2.7 J
Potassium	525	561	458	1190 J	1250	455 J	1200	593 J	808 J	749 J	261 J	80.5 J
Selenium	0.79 U	1.1 UJ	0.77 UL	2.2 UJ	2.7 UJ	0.97 U	0.75 UL	1.2 UJ	0.86 U	0.78 UL	0.85 UL	6.2 U
Silver	0.21 U	0.2 U	0.45 U	0.63 UJ	0.13 U	0.15 U	0.21 U	0.17 U	0.17 U	0.15 U	0.38 U	1.8 U
Sodium	202 U	119	133 U	163 J	331	89.6 U	257	3.6 U	180	102 U	163 U	267 J
Thallium	0.58 U	1.8 U	1.8	2 UJ	2.9 UJ	1.1 U	0.87 U	2.0 U	1.1 U	1.3 U	0.92 U	4.4 U
Vanadium	37.2	37.5	26.1	64.2 J	63.2	19.6	53.2	40.7	50.0	46.2	21.6	5.7 J
Zinc	143	66.7	132 J	285 J	295	46.4	256	207 J	243	212	99.9	21.6 J
<b>Pesticides/Herbicides (µg/kg)</b>												
4,4'-DDD	5.5 U	3 J	5.7 U	8 UJ	11 U	1.6 J	--	--	--	--	--	2.3 JP
4,4'-DDE	5.5 U	6.6	5.7 U	5.2 J	11 U	3.8 J	--	--	--	--	--	4.3 U
4,4'-DDT	5.5 U	5.2 U	5.7 U	8 UJ	11 U	2.6 J	--	--	--	--	--	6.7
Aldrin	2.8 U	2.7 U	2.9 U	4.1 UJ	5.5 U	2.5 U	--	--	--	--	--	2.2 U
alpha-BHC	2.8 U	2.7 U	2.9 U	4.1 UJ	5.5 U	2.5 U	--	--	--	--	--	2.2 U
Alpha-Chlordane	6.7 JN	1.3 J	16	17 J	21 JN	3.1 J	--	--	--	--	--	11 JN
beta-BHC	15 JN	2.7 U	2.9 U	20 J	5.5 U	2.5 U	--	--	--	--	--	2.2 U
delta-BHC	2.8 U	2.7 U	2.9 U	4.1 UJ	5.5 U	2.5 U	--	--	--	--	--	2.2 U
Dieldrin	5.5 U	5.2 U	5.7	4 J	11 U	1.4 J	--	--	--	--	--	2.2 U
Endosulfan I	2.8 U	2.7 U	2.9 U	4.1 UJ	5.5 U	2.5 U	--	--	--	--	--	2.2 U
Endosulfan II	5.5 U	5.2 U	5.7 U	8 UJ	11 U	4.9 U	--	--	--	--	--	4.3 U
Endosulfan sulfate	5.5 U	5.2 U	5.7 U	8 UJ	11 U	1.5 J	--	--	--	--	--	4.3 U
Endrin	5.5 U	5.2 U	5.7 U	4.1 UJ	11 U	4.9 U	--	--	--	--	--	4.3 U
Endrin Aldehyde	5.5 U	5.2 U	5.7 U	4.5 J	3.2 J	1.5 J	--	--	--	--	--	4.3 U
Endrin Ketone	5.5 U	5.2 U	5.7 U	8 UJ	10 J	4.9 U	--	--	--	--	--	3.5 J
gamma-BHC (Lindane)	2.8 U	2.7 U	2.9 U	4.1 UJ	5.5 U	2.5 U	--	--	--	--	--	2.2 U
gamma-Chlordane	4.2 JN	1.4 J	7.5 JN	6.3 JN	5.5 U	2.5 U	--	--	--	--	--	8.7
Heptachlor	2.8 U	2.7 U	2.9 U	4.1 UJ	5.5 U	2.5 U	--	--	--	--	--	2.2 U
Heptachlor Epoxide	5.2 JN	2.7 U	2.9 U	2.1 J	5.5 U	2.5 U	--	--	--	--	--	2.2 U
Methoxychlor	28 U	27 U	7.7 J	12 J	14 J	25 U	--	--	--	--	--	22 U
Toxaphene	--	--	--	410 UJ	550 U	250 U	--	--	--	--	--	220 U

N - Analysis indicates the presence of an analyte for which there is presumptive evidence to make a "tentative identification"

U - Analyte was not detected above the reporting limit.

J - Estimated concentration.

-- Not analyzed.

D - Sample diluted in the lab for analysis.

K - Analyte present. May be biased High.

L - Analyte present. May be biased low

R - Data Rejected

P - Discrepancy in GC analysis. Lower value reported.

S - Sample spike recovery is outside of control limits

**Table 5**  
 Quality Assurance and Quality Control Sample Results for October 2009  
 for Groundwater and Blanks  
 Vicinity of the Army Creek and Delaware Sand & Gravel Landfills

Parameter				
	PW-1U	MW-96 DUP of PW-1U	Field Blank	Trip Blank
<b>Non-Halogenated VOCs (µg/l)</b>				
Benzene	100	100	1.0 U	1.0 U
Toluene	240	230	1.0 U	1.0 U
Ethylbenzene	44	42	1.0 U	1.0 U
Xylene (total)	150	140	3.0 U	3.0 U
2-Butanone	100 U	100 U	5.0 U	5.0 U
Acetone	100 U	100 U	5.0 U	6.0
Carbon Disulfide	20 U	20 U	1.0 U	1.0 U
Cyclohexane	20 U	20 U	1.0 U	1.0 U
Isopropylbenzene	4.5 J	3.9 J	1.0 U	1.0 U
Methyl-tert-butyl ether	20 U	20 U	1.0 U	1.0 U
Methylcyclohexane	5.5 J	5.4 J	1.0 U	1.0 U
Styrene	20 U	20 U	1.0 U	1.0 U
4-Methyl-2-pentanone	100 U	100 U	5.0 U	5.0 U
<b>Halogenated VOCs (µg/l)</b>				
Bromoform	20 U	20 U	1.0 U	1.0 U
Bromodichloromethane	20 U	20 U	1.0 U	1.0 U
Carbon Tetrachloride	20 U	20 U	1.0 U	1.0 U
Chlorobenzene	4.0 J	3.4 J	1.0 U	1.0 U
Chloroform	20 U	20 U	1.0 U	1.0 U
Dibromochloromethane	20 U	20 U	1.0 U	1.0 U
1,2-Dichlorethane	20 U	20 U	1.0 U	1.0 U
1,1-Dichlorethane	20 U	20 U	1.0 U	1.0 U
cis-1,2-Dichloroethene	20 U	20 U	1.0 U	1.0 U
trans-1,2-dichloroethene	20 U	20 U	1.0 U	1.0 U
1,1-Dichloroethene	20 U	20 U	1.0 U	1.0 U
1,2-Dichloroethene (total)	20 U	20 U	1.0 U	1.0 U
1,2-Dichlorobenzene	20 U	20 U	1.0 U	1.0 U
1,3-Dichlorobenzene	20 U	20 U	1.0 U	1.0 U
1,4-Dichlorobenzene	20 U	20 U	1.0 U	1.0 U
Chloroethane	20 U	20 U	1.0 U	1.0 U
Chloromethane	20 UJ	20 UJ	1.0 UJ	1.0 UJ
Tetrachloroethene	20 U	20 U	1.0 U	1.0 U
1,1,1-Trichloroethane	20 U	20 U	1.0 U	1.0 U
1,1,2-Trichloroethane	20 U	20 U	1.0 U	1.0 U
1,1,2,2-Tetrachloroethane	20 U	20 U	1.0 U	1.0 U
Trichloroethene	20 U	20 U	1.0 U	1.0 U
Vinyl Chloride	20 U	20 U	1.0 U	1.0 U
1,2,4-Trichlorobenzene	20 U	20 U	1.0 U	1.0 U
cis-1,3-Dichloropropene	20 U	20 U	1.0 U	1.0 U
Methylene Chloride	7.9 J	8.0 J	1.0 U	0.16 J
Trichlorofluoromethane	20 U	20 U	1.0 U	1.0 U
<b>Semi-Volatiles (µg/l)</b>				
Bis(2-chloroethyl)Ether	31	36	5 U	--
Bis(2-ethylhexyl)phthalate	5.0 UJ	5 U	5 U	--
2,2'-oxybis (1-Chloropropane)	5 U	5 U	5 U	--
2,4-Dimethylphenol	2.0 J	2.5 J	5 U	--
2-Methylnaphthalene	5 U	5 U	5 U	--
2-Methylphenol	5.0 R	3.0 J	5 U	--
4-Methylphenol	5 U	5 U	5 U	--
Acetophenone	5 U	5 U	5 U	--
Caprolactam	5 U	5 U	5 U	--
Diethylphthalate	5.0 R	1.1 J	5 U	--
Dimethylphthalate	5 U	5 U	5 U	--
N-Nitrosodiphenylamine	5 U	5 U	5 U	--
Naphthalene	5 U	5 U	5 U	--
1,1'- Biphenyl	5 U	5 U	5 U	--
Di (n-butyl) phthalate	5 U	5 U	5 U	--
2,4-Dichlorophenol	5 U	5 U	5 U	--
bis (2-chloroethoxy)methane	5 U	5 U	5 U	--
Di-n-octylphthalate	5 U	5 U	5 U	--
Phenol	1.3 J	4.8 J	5 U	--
<b>Inorganics (mg/l)</b>				
Dissolved Manganese	3.44	3.44	0.015 U	--
Dissolved Iron	31.2	31.1	0.100 U	--

-- Not analyzed

U - Analyte was not detected above the reporting limit

J - Estimated concentration.

K - Analyte present, reported value may be biased high.

L - Analyte present, reported value may be biased low.

UL - Not detected, quantitation limit is probably higher

D - Sample diluted in the lab for analysis.

NP - Well not pumping

P - Discrepancy in GC analysis. Lower value reported

B - Analyte Detected in Method Blank

R - Data Rejected

**Table 5 (continued)**  
 Quality Assurance and Quality Control Sample Results for October 2009  
 for Surface Water and Sediments  
 Vicinity of the Army Creek and Delaware Sand & Gravel Landfills

Parameter	SWA	SWH DUP of SWA	SEDA	SEDH DUP of SEDH
<b>Semi-Volatiles</b>				
1,1'-Biphenyl	5.0 U	5.0 U	270 U	270 U
2,2'-oxybis (1-Chloropropane)	5.0 U	5.0 U	270 U	270 U
2,4-Dimethylphenol	5.0 U	5.0 U	270 U	270 U
2,4-Dinitrophenol	10 U	10 U	520 U	520 U
2,6-Dinitrotoluene	5.0 U	5.0 U	270 U	270 U
2-Methylnaphthalene	5.0 U	5.0 U	270 U	270 U
2-Methylphenol	5.0 U	5.0 U	270 U	270 U
4,6-Dinitro-2-methylphenol	10 U	10 U	520 U	520 U
4-Methylphenol	5.0 U	5.0 U	270 U	270 U
Acetophenone	5.0 U	5.0 U	180 J	84 J
Atrazine	5.0 UJ	5.0 UJ	270 UJ	270 UU
Benzaldehyde	5.0 UJ	5.0 UJ	270 UJ	270 UU
Benzo (a) anthracene	5.0 U	5.0 U	270 U	59 J
Benzo (a) pyrene	5.0 U	5.0 U	270 U	72 J
Benzo (b) Fluoranthene	5.0 U	5.0 U	270 U	89 J
Benzo (g,h,i) Perylene	5.0 U	5.0 U	270 U	270 U
Benzo (k) Fluoranthene	5.0 U	5.0 U	270 U	92 J
Bis(2-chloroethyl)Ether	5.0 U	5.0 U	270 U	270 U
Bis(2-ethylhexyl)phthalate	5.0 U	5.0 U	670	210 J
Caprolactam	5.0 U	5.0 U	270 U	270 U
Di-n-butyl phthalate	5.0 U	5.0 U	270 U	270 U
Di-n-octyl phthalate	5.0 U	5.0 U	270 U	270 U
Dibenzo (a,h) Anthracene	5.0 U	5.0 U	270 U	270 U
Diethylphthalate	5.0 U	5.0 U	270 U	270 U
Hexachlorocyclopentadiene	5.0 U	5.0 U	270 R	270 R
Indeno (1,2,3-cd) Pyrene	5.0 U	5.0 U	270 U	66 J
N-Nitrosodiphenylamine	5.0 U	5.0 U	270 U	270 U
Naphthalene	5.0 U	5.0 U	270 U	270 U
Pentachlorophenol	5.0 U	5.0 U	520 U	520 U
Phenol	5.0 U	5.0 U	270 U	270 U
Chrysene	5.0 U	5.0 U	270 U	96 J
Fluoranthene	5.0 U	5.0 U	270 U	100 J
Phenanthrene	5.0 U	5.0 U	270 U	270 U
Carbazole	5.0 U	5.0 U	270 U	270 U
Pyrene	5.0 U	5.0 U	270 U	270 U
<b>Inorganics</b>				
Aluminum	200 U	200 U	21900 J	35600
Antimony	60.0 U	60.0 U	10.6 UL	10.4 UL
Arsenic	10.0 U	10.0 U	3.6	3.5
Barium	39.5 J	41.0 J	88.1	100
Beryllium	5.0 U	5.0 U	1.2	1.3
Cadmium	5.0 U	5.0 U	0.88 U	0.87 U
Calcium	14900	16300	746 J	695 J
Chromium	10.0 U	10.0 U	21.4 J	25.5 J
Cobalt	50.0 U	50.0 U	19.9	14.9
Copper	25.0 U	25.0 U	13.7 J	12.7 J
Dissolved Iron	140	170	26300 J	32600 J
Lead	10.0 U	10.0 U	26.2 K	19.0 K
Magnesium	4720 J	5080	874 J	824 J
Dissolved Manganese	86.2	92.4	207 J	185 J
Mercury	0.20 U	0.20 U	0.18 U	0.18 U
Nickel	40.0 U	40.0 U	12.6	14.8
Potassium	3780 J	3850 J	680 J	802 J
Selenium	35.0 U	35.0 U	1.2 J	1.3 J
Silver	10.0 U	10.0 U	1.8 U	1.7 U
Sodium	20600	21600	533 J	234 J
Thallium	25.0 U	25.0 U	4.4 U	4.3 U
Vanadium	50.0 U	50.0 U	46.4 J	54.3 J
Zinc	60.0 U	60.0 U	46.8 J	47.4 J
<b>Pesticides/Herbicides</b>				
4,4'-DDD	0.10 U	0.10 U	5.2 U	5.2 U
4,4'-DDDE	0.10 U	0.10 U	1.9 J	1.6 J
4,4'-DDT	0.10 U	0.10 U	5.2 U	5.2 U
Aldrin	0.029 J	0.050 U	2.7 U	2.7 U
alpha-BHC	0.050 U	0.050 U	2.7 U	2.7 U
Alpha-Chlorodane	0.050 U	0.050 U	5.2 U	5.2 U
beta-BHC	0.050 U	0.050 U	2.7 U	2.7 U
delta-BHC	0.050 U	0.050 U	2.7 U	2.7 U
Dielein	0.10 U	0.10 U	5.2 U	5.2 U
Endosulfan I	0.050 U	0.050 U	2.7 U	2.7 U
Endosulfan II	0.10 U	0.10 U	5.2 U	5.2 U
Endosulfan sulfate	0.10 U	0.10 U	5.2 U	5.2 U
Endrin	0.10 U	0.10 U	5.2 U	5.2 U
Endrin Aldehyde	0.10 U	0.10 U	5.2 U	5.2 U
Endrin Ketone	0.10 U	0.10 U	5.2 U	5.2 U
gamma-BHC (Lindane)	0.050 U	0.050 U	2.7 U	2.7 U
gamma-Chlorodane	0.050 U	0.050 U	5.2 U	5.2 U
Heptachlor	0.050 U	0.050 U	2.7 U	2.7 U
Heptachlor Epoxide	0.050 U	0.050 U	2.7 U	2.7 U
Methoxychlor	0.050 U	0.050 U	27 U	27 U
Toxaphene	5.0 U	5.0 U	270 U	270 U

U - Analyte was not detected above the reporting limit

J - Estimated concentration.

K - Analyte present, reported value may be biased high.

L - Analyte present, reported value may be biased low.

UL - Not detected, quantitation limit is probably higher

P - Discrepancy in GC analysis. Lower value reported

R - Data Rejected

All Surface water data presented in µg/l

SEDA data - Inorganics presented in mg/kg, all others in µg/kg

CHECKED: MR

DRAFTER: CP

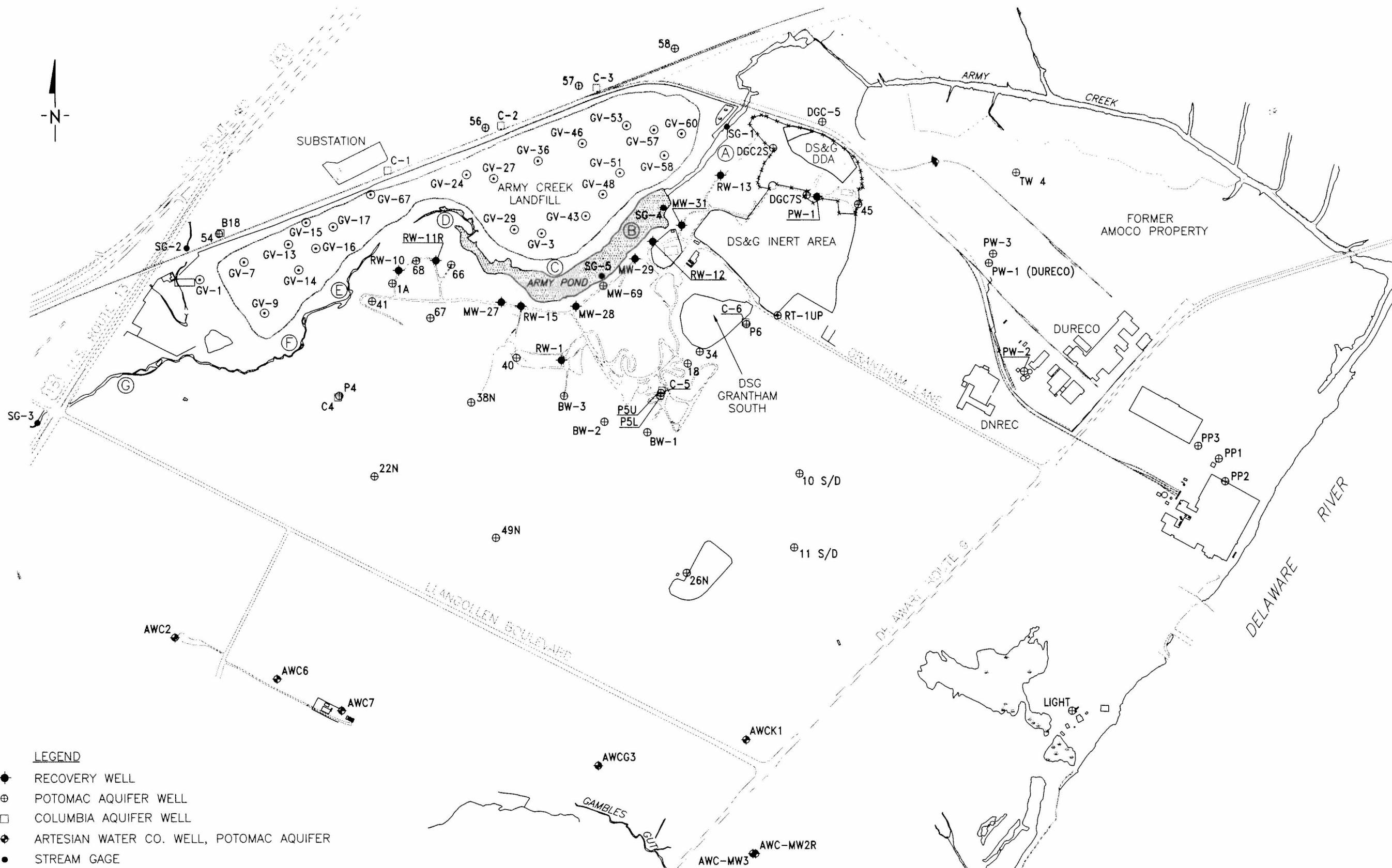
FILE NAME: ACL-002A.DWG

PROJECT NO: ACL

DWG DATE: 7-6-05

- LEGEND**
- RW-1 ● RECOVERY WELL
  - 22 ⊕ POTOMAC AQUIFER WELL
  - B12 □ COLUMBIA AQUIFER WELL
  - AWC2 ♦ ARTESIAN WATER CO. WELL, POTOMAC AQUIFER
  - SG-2 ● STREAM GAGE
  - CONRAIL RAILROAD
  - FENCE LINE
  - GV-1 ○ GAS VENT
  - (G) SURFACE/SEDIMENT SAMPLE SPOT

0 700 1400  
SCALE IN FEET



**RUTH ASSOCIATES, INC**  
8 East High Point Road  
Stuart, Florida 34996

### MONITORING LOCATIONS

Vicinity of Army Creek and  
Delaware Sand & Gravel Superfund Sites

FIGURE  
1

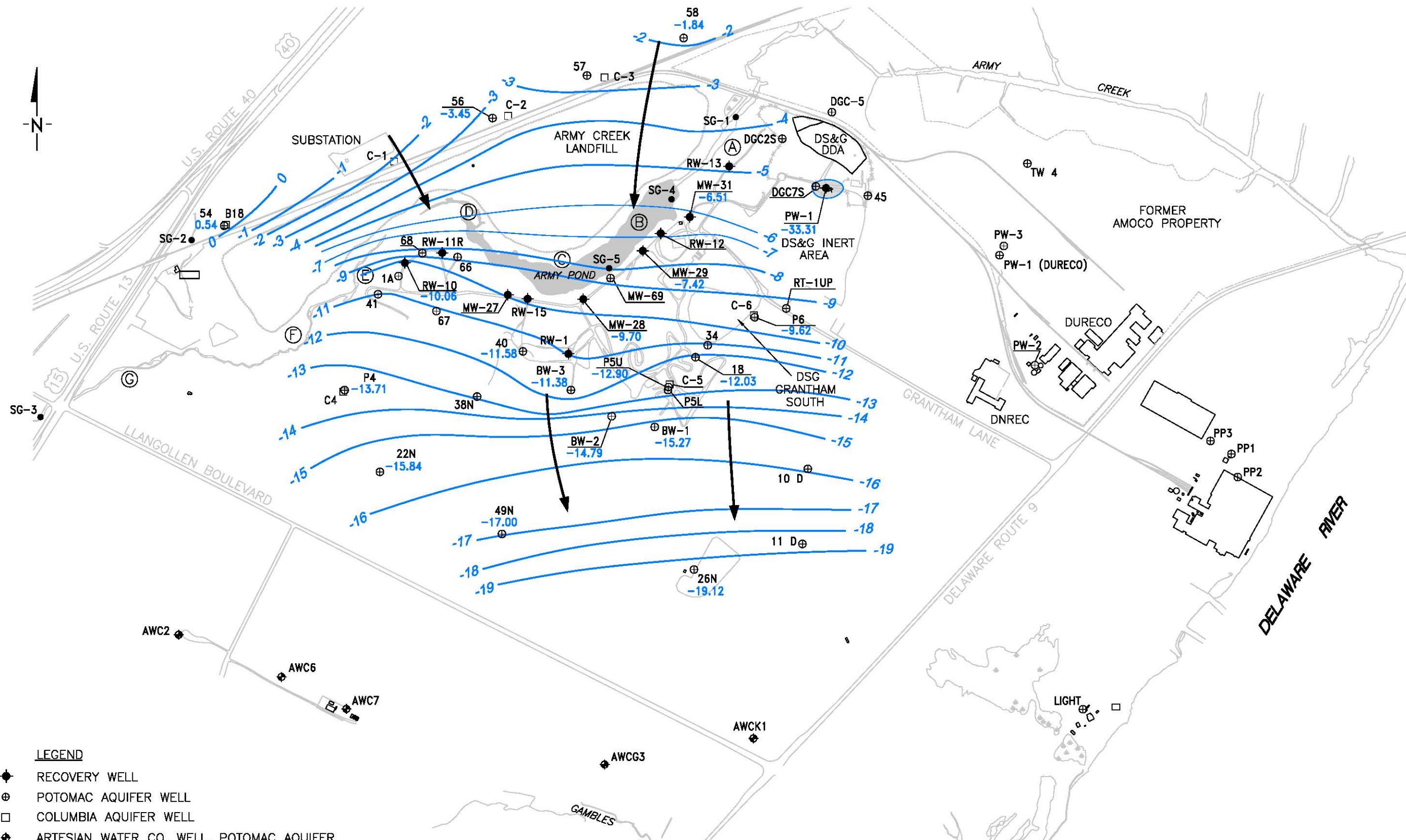
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DRAFTER: CP

FILE NAME: ACL-205A.DWG

PROJECT NO: ACL

DWG DATE: 1-13-10



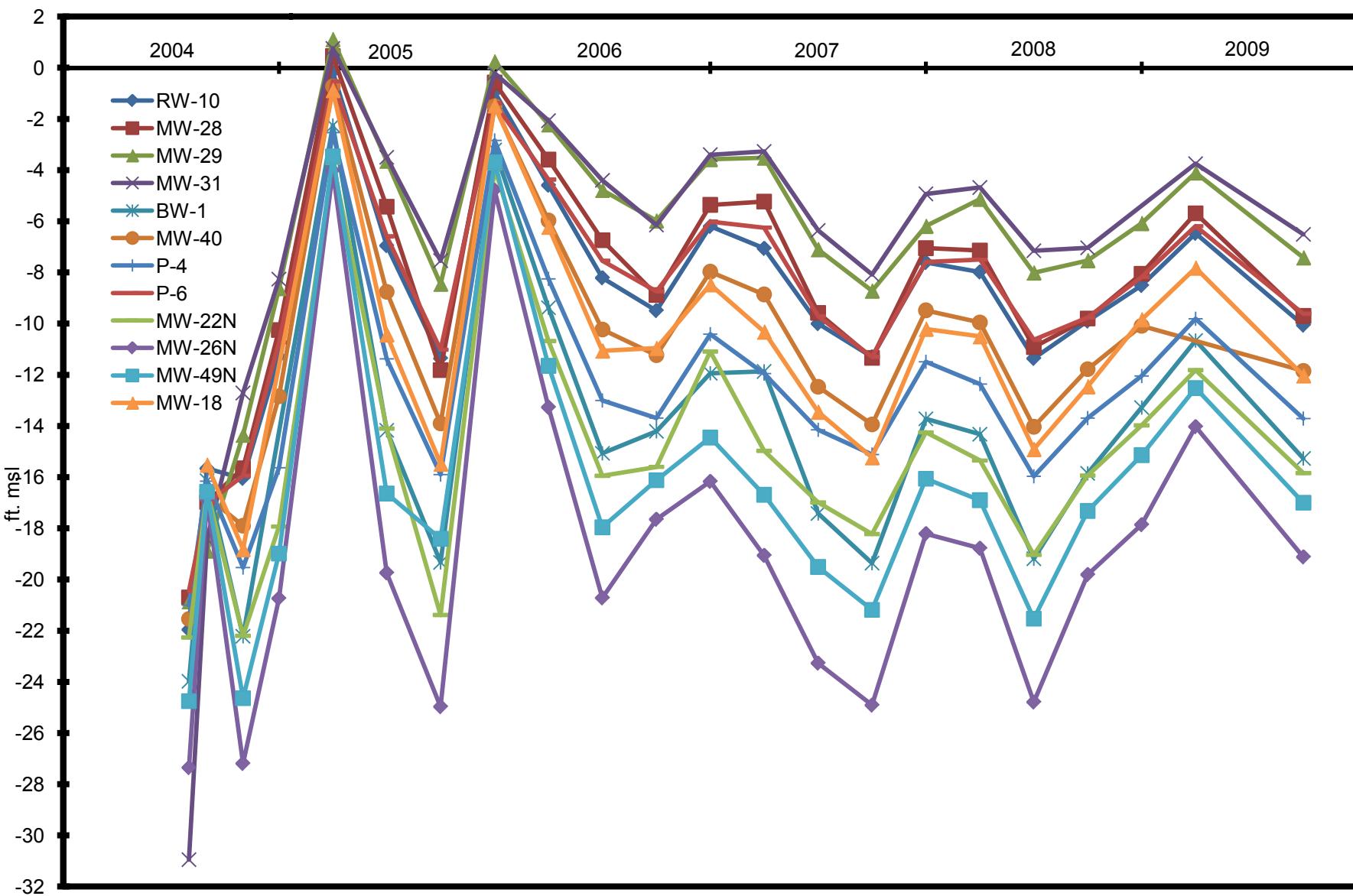
0 700 1400  
SCALE IN FEET

**RUTH ASSOCIATES, INC**  
8 East High Point Road  
Stuart, Florida 34996

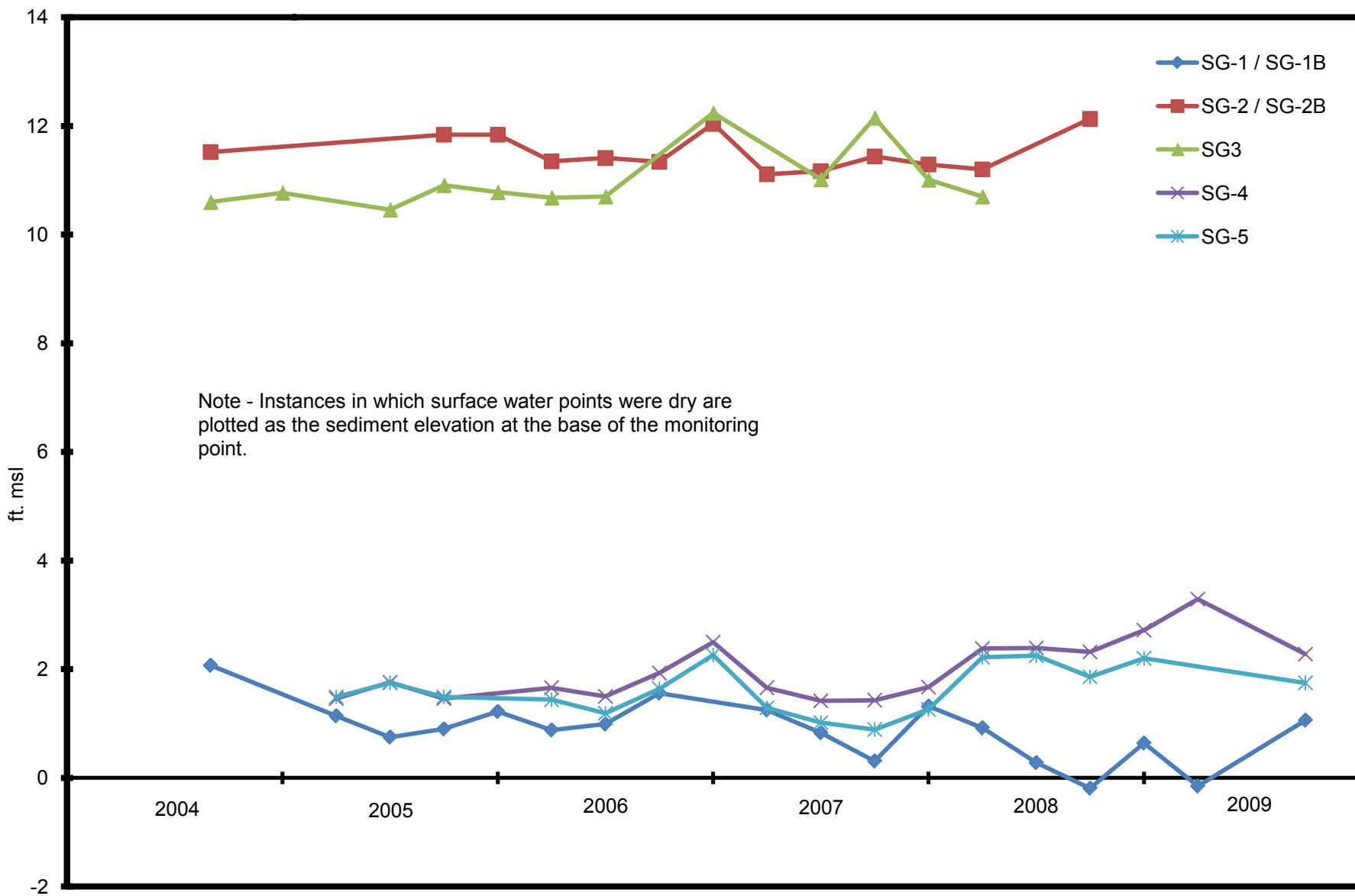
**GROUNDWATER ELEVATION MAP - OCTOBER 2009**  
Vicinity of Army Creek and  
Delaware Sand & Gravel Superfund Sites

FIGURE  
2

**Figure 3**  
**Water Elevation Graph**  
**Army Creek Landfill and Vicinity - New Castle, Delaware**



**Figure 4**  
**Surface Water Elevation Graph**  
**Army Creek Landfill and Vicinity - New Castle, Delaware**



## NOTES:

- HISTORICAL DATA SHOWN IS A COMBINATION OF DATA COLLECTED ON BEHALF OF NCC AND THE DS&G REMEDIAL TRUST.
- UNITS IN MICROGRAMS PER LITER

CHECKED: MR

DRAFTER: CP

FILE NAME: ACL-212A.DWG

PROJECT NO: ACL

DWG DATE: 2-18-10

MW-40	
7/02	1.1
10/02	0.041 J
1/03	0.7
4/03	0.8
7/03	0.2
10/04	2.5 J
1/05	0.26 B
4/05	0.14
7/05	0.083
10/05	0.019 U
1/06	0.57
4/06	0.46
7/06	0.33
10/06	0.24
1/07	0.043
4/07	0.018 U
10/07	5 U
10/08	5.3 U
10/09	5 U

RW-10	
4/02	0.018
7/02	0.04 U
10/02	0.05 U
1/03	0.02 J
4/03	0.05 U
7/03	0.05 U
10/04	0.054 U
1/05	0.019 U
4/05	0.02 U
7/05	0.02 U
10/05	0.018 U
1/06	5 U
4/06	5 U
7/06	5 U
10/06	5 U
1/07	5 U
4/07	5 U
10/07	5 U
4/08	5 U
10/08	5.3 U
4/09	5.1 U
10/09	5.3 U

MW-28	
4/02	0.98
7/02	0.37
10/02	0.23
1/03	0.2
10/04	0.076
1/05	0.06
4/05	0.046
7/05	0.02 U
10/05	0.3
1/06	5 U
4/06	5 U
7/06	5 U
10/06	5 U
1/07	5 U
4/07	5 U
10/07	5 U
4/08	6.9
10/08	5 U
4/09	5.1 U
10/09	5.3 U

MW-29	
1/03	10
4/03	14
7/03	14 D
10/04	0.67
1/05	0.89
4/05	0.29
7/05	0.4
10/05	0.29
1/06	5 U
4/06	5 U
7/06	5 U
10/06	5 U
1/07	5 U
4/07	5 U
10/07	5 U
4/08	5 U
10/08	5.3 U
4/09	5.1 U
10/09	5.6 U

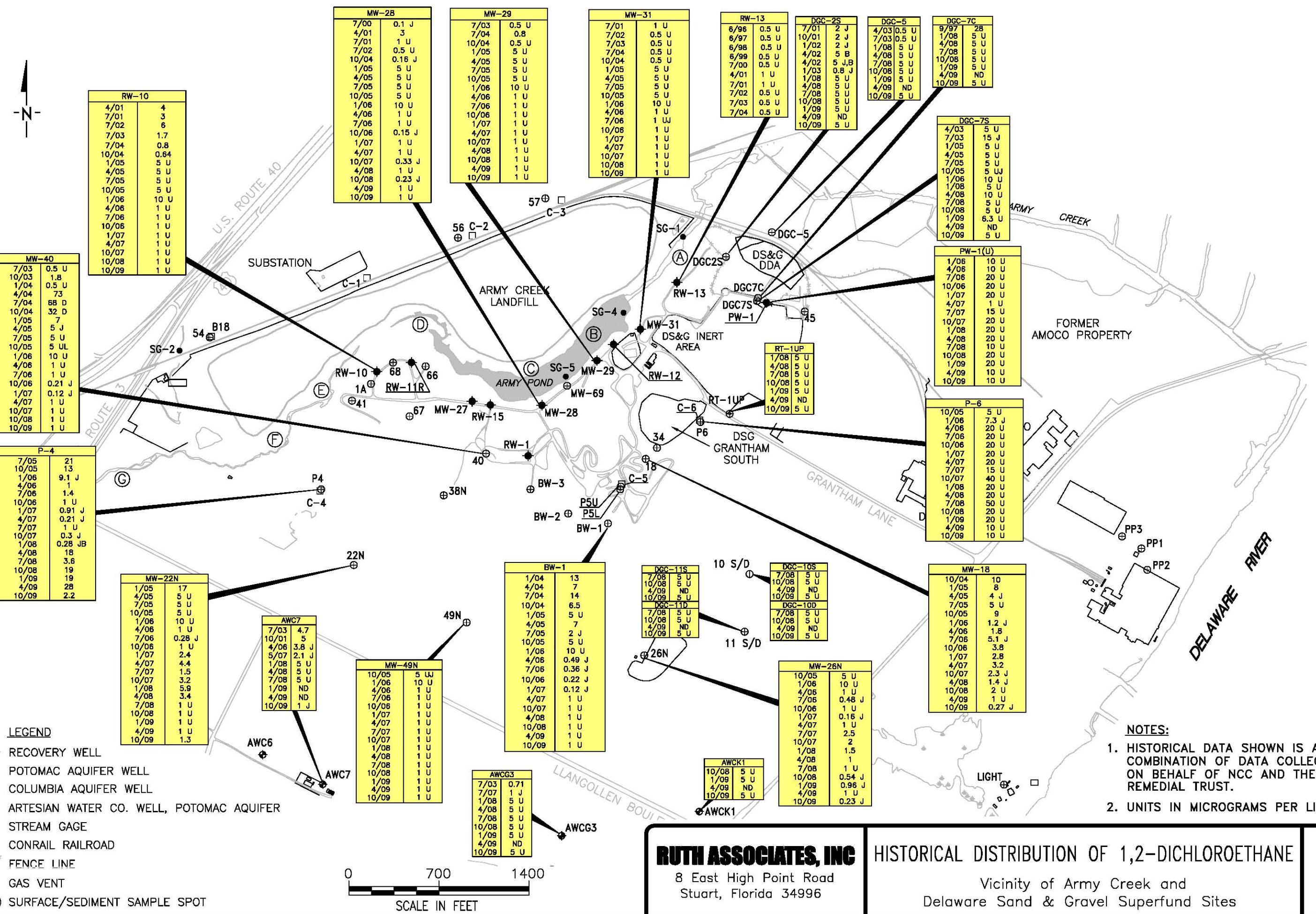
MW-31	
10/02	0.079
1/03	0.1
4/03	0.1
7/03	0.1
10/04	13
1/05	0.0095 J
4/05	0.019 J
7/05	0.099
10/05	0.018 U
1/06	5 U
4/06	5 U
7/06	5 U
10/06	5 U
1/07	5 U
4/07	5 U
10/07	5 U
4/08	5 U
10/08	5.3 U
4/09	5.1 U
10/09	5.6 U

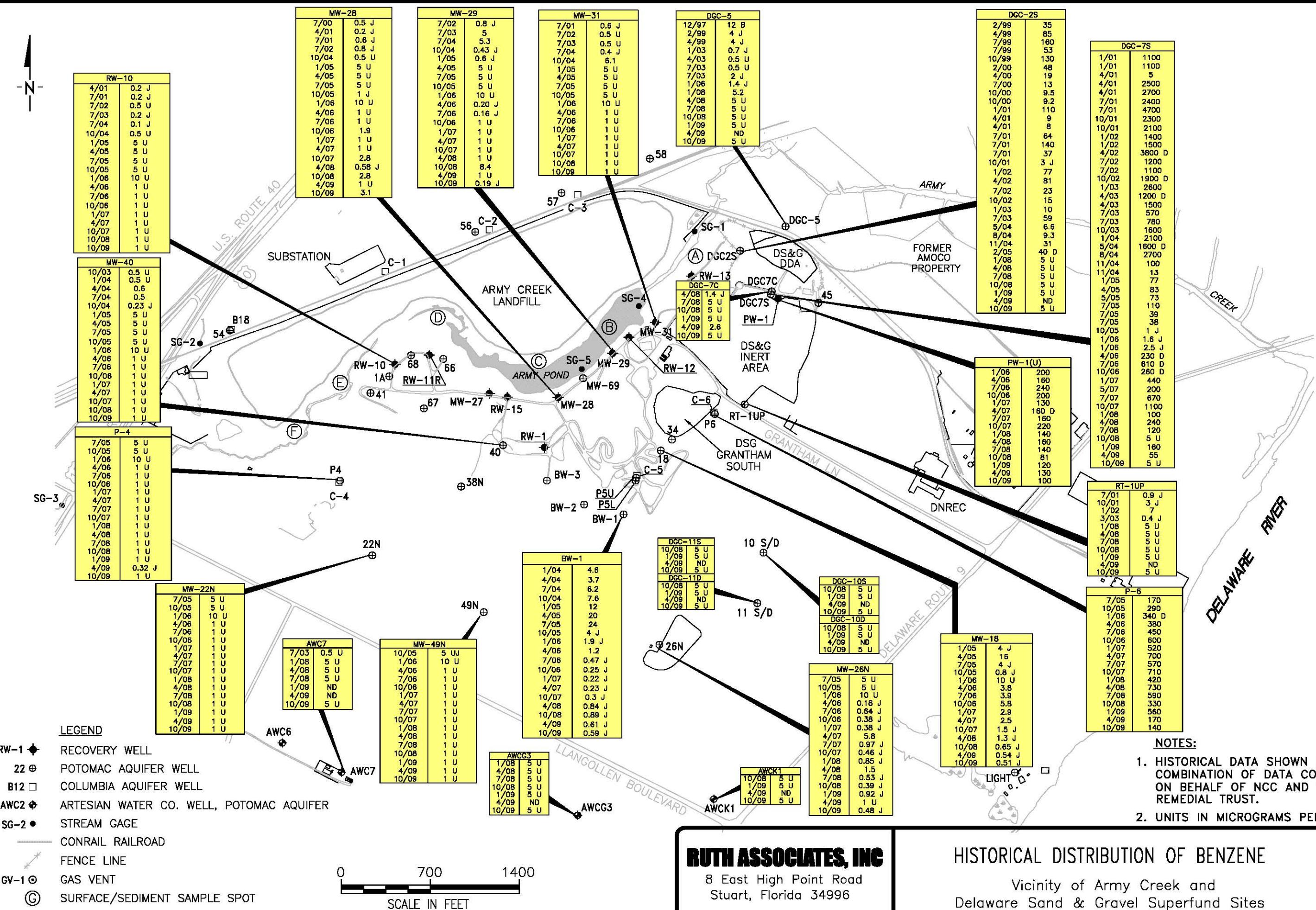
DGC-5	
4/02	0.11
7/02	0.047 B
10/02	0.091
1/03	0.2
4/03	0.16
7/03	0.03 J
10/05	0.13
1/06	0.22
4/06	0.15
7/06	0.21
10/06	0.19
1/07	0.11
4/07	0.1
7/07	0.17
10/08	5 U
1/09	ND
4/09	ND
10/09	5 U

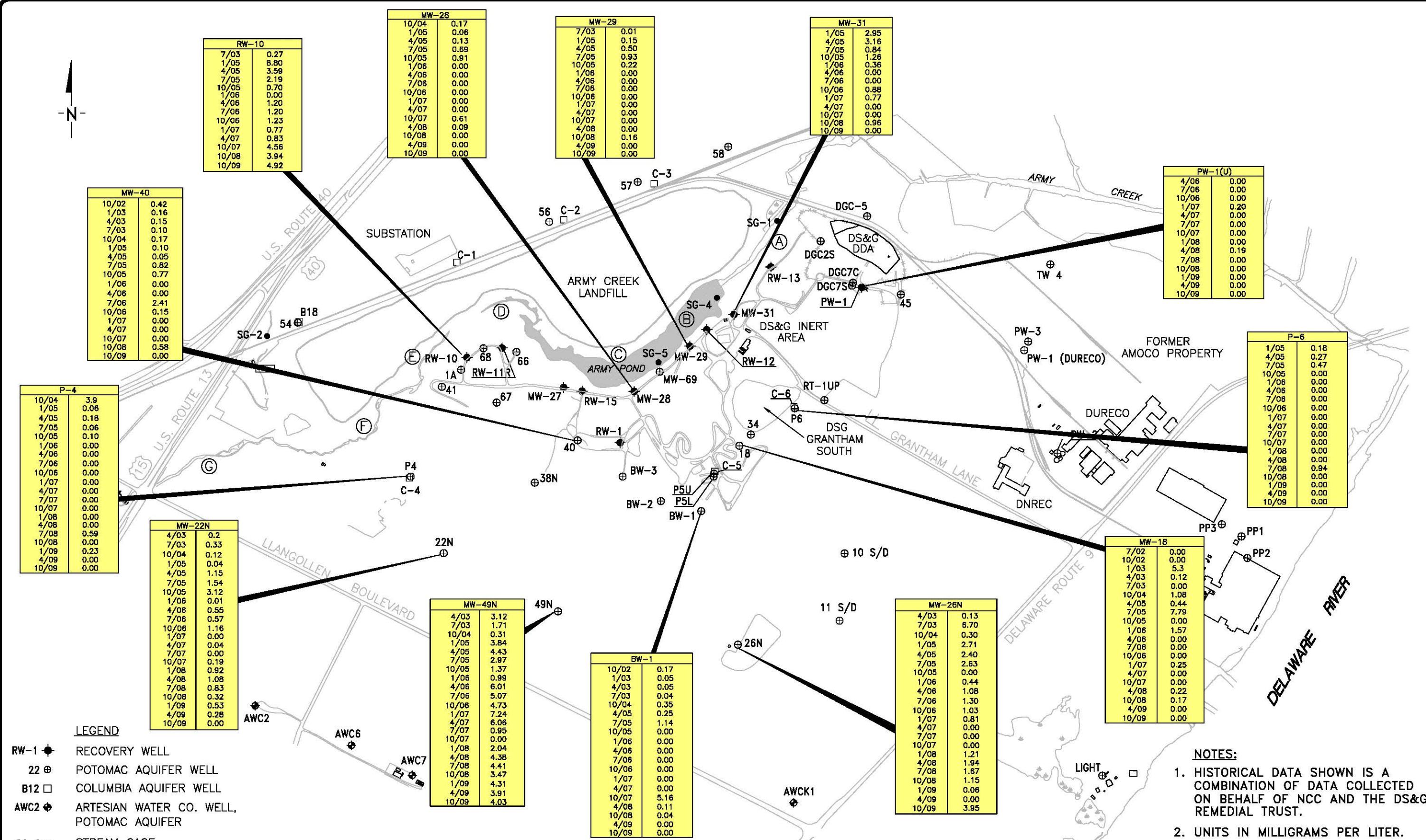
DGC-2S	
7/01	16
7/02	11
10/01	2.9
1/02	1.8 J
4/02	2.5
1/03	5 J
4/02	5.6
7/02	6.4
7/02	4.6
7/02	3.4
10/02	6.1
1/03	4 J
4/02	2
7/03	8 J
10/02	100
1/03	470
4/02	480 D
6/02	1400
7/02	1100
7/02	740
7/02	490
7/02	570
10/02	100
1/03	250 D
1/03	630
1/03	760
4/03	470 D
4/03	320
4/03	260
7/03	330 D
7/03	480
10/03	260
1/04	580
5/04	310
8/04	440
11/04	21
1/05	8.2
2/05	0.14
4/05	12
5/05	9.2 J
7/05	24
7/05	6 J
7/05	7.7 J
10/05	0.7
10/05	0.64
1/06	5 U
4/06	0.51
7/06	93
10/06	40 J
1/07	66
5/07	35
7/07	85
10/07	330
10/07	270
1/08	18
4/08	72
7/08	19
10/08	31
1/09	24
4/09	18
10/09	5 U

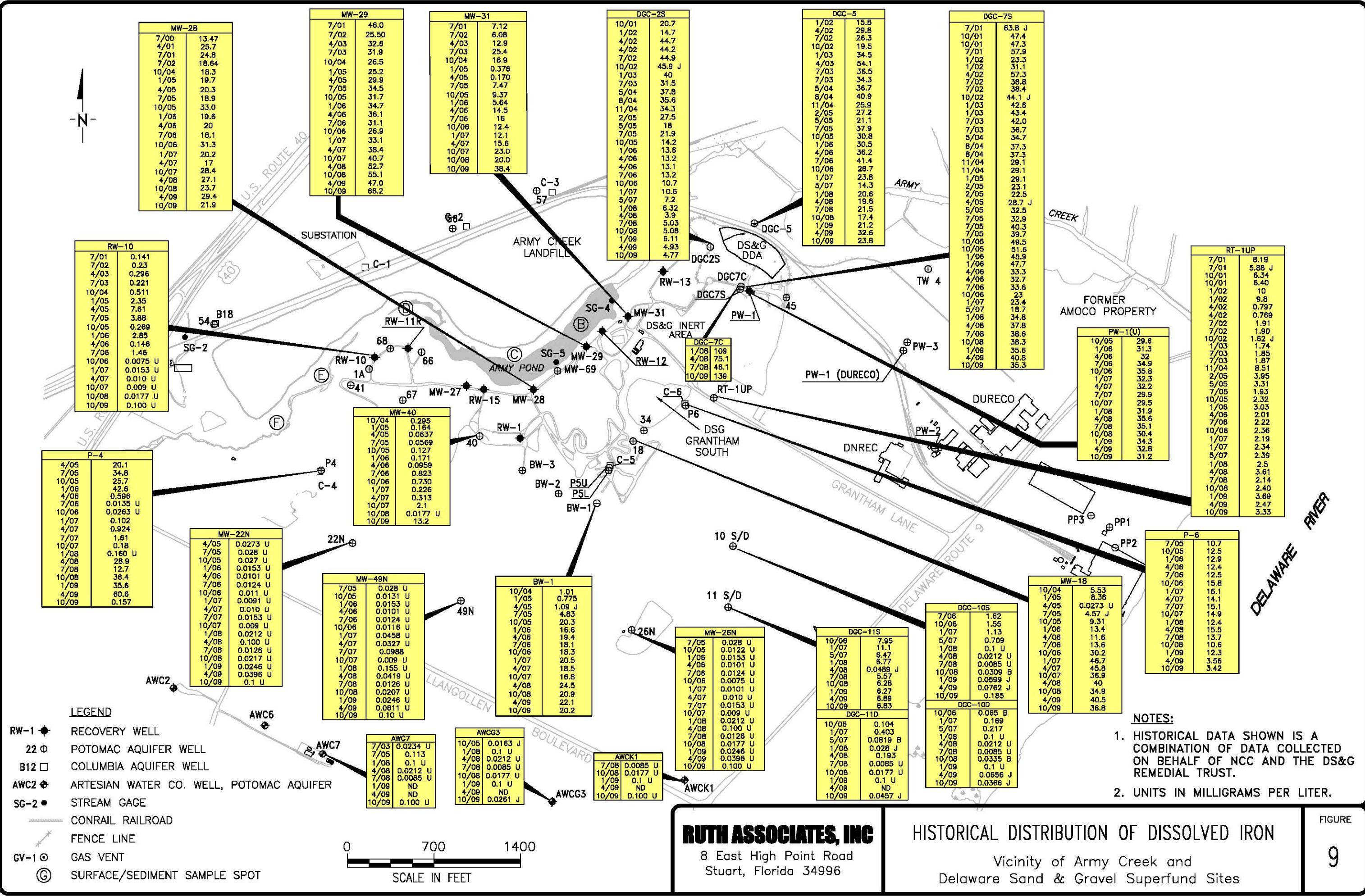
PW-1(U)	
1/05	110 D
4/05	61
7/05	53
1/06	55
4/06	46
7/06	57
10/06	39
1/07	40
4/07	42
7/07	47
10/07	40
1/08	31
4/08	37
7/08	43
10/08	31
1/09	34
4/09	27
10/09	31

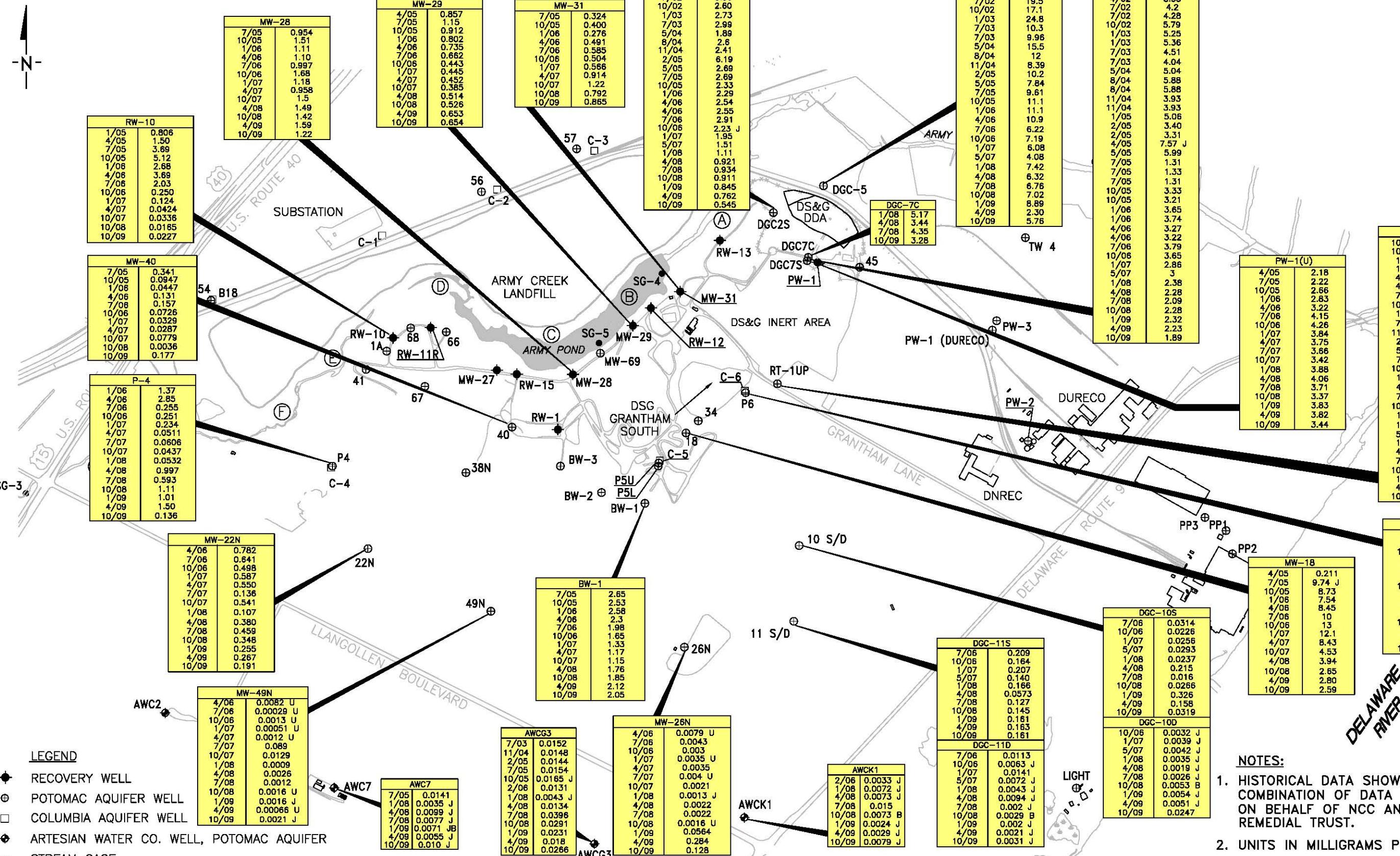
DGC-7S	
10/01	420
10/01	220 L
1/02	180
1/02	890
1/02	730
4/02	480 D
4/02	1400
6/02	1100
7/02	740
7/02	490
7/02	570
10/02	100
1/03	470
1/03	250 D
1/03	630
1/03	760
4/03	470 D
4/03	320
4/03	260
7/03	330 D
7/03	480
10/03	260
1/04	580
5/04	310
8/04	440
11/04	21
1/05	8.2
2/05	0.14
4/05	12
5/05	9.2 J
7/05	24
7/05	6 J
7/05	7.7 J
10/05	0.7
10/05	0.64
1/06	5 U





**RUTH ASSOCIATES, INC**8 East High Point Road  
Stuart, Florida 34996**HISTORICAL DISTRIBUTION OF DISSOLVED OXYGEN**Vicinity of Army Creek and  
Delaware Sand & Gravel Superfund Sites



**RUTH ASSOCIATES, INC.**8 East High Point Road  
Stuart, Florida 34996**HISTORICAL DISTRIBUTION OF DISSOLVED MANGANESE**Vicinity of Army Creek and  
Delaware Sand & Gravel Superfund Sites**FIGURE**  
**10**

- NOTES:**
1. HISTORICAL DATA SHOWN IS A COMBINATION OF DATA COLLECTED ON BEHALF OF NCC AND THE DS&G REMEDIAL TRUST.
  2. UNITS IN MILLIGRAMS PER LITER.

# **FIGURES**

# **APPENDIX A**

## **USEPA APPROVAL LETTERS**



UNITED STATES ENVIRONMENTAL PROTECTION AGENCY  
REGION III  
1650 Arch Street  
Philadelphia, Pennsylvania 19103-2029

May 4, 2009

Mr. Michael Harris  
Department of Special Services  
New Castle County  
87 Reads Way  
Wilmington DE 19720

RE: Completion of Scope of Work-2  
Minor Modification to Operation & Maintenance Plan  
Army Creek Landfill Superfund Site

Dear Mr. Harris:

I am writing in response to a letter dated January 12, 2009, from Michele Ruth of Ruth Associates, Inc. on behalf of New Castle County (the County) requesting approval from the United States Environmental Protection Agency (EPA) to terminate Scope of Work-2 (SOW-2) as set forth in Exhibit 4 of the Army Creek Consent Decree (Civil Action Nos. 91-409 and 91-418). This confirms EPA's approval for the County to terminate SOW-2 subject to the following conditions.

The County will submit for EPA approval an addendum to the February 1992 Operations and Maintenance, Phase I plan in order to provide for long-term groundwater and stream monitoring, as outlined in attached Table 1 and Figure 1. This modification constitutes a minor modification of the studies required for the completion of Work-2, in accordance with Section XI.D of the Consent Decree.

EPA is also requiring implementation of a plan for the decommissioning or abandonment of various groundwater recovery and monitoring wells as outlined in attached Table 2, and the decommissioning of the groundwater recovery system and treatment plant. The well abandonment and decommissioning of the transmission system will be implemented in mid-2009. The treatment plant will be maintained until January of 2011 per EPA's request.

Please feel free to contact me if you have any questions regarding this matter.

Sincerely,



Debra Rossi  
Remedial Project Manager  
DE, VA, WV Remedial Branch

cc: John Cargill, DNREC  
Stacie Driscoll, EPA  
Cynthia Nadolski, Esq., EPA  
Michele Ruth, Ruth Associates  
Jim Webb, EPA  
George Weiner, Esq., Blank Rome

Attachments



*Printed on 100% recycled/recyclable paper with 100% post-consumer fiber and process chlorine free.*  
*Customer Service Hotline: 1-800-438-2474*

RUTH ASSOCIATES, INC.

**Table 1.**  
**Long-Term Monitoring Program**  
**Army Creek Landfill - New Castle, Delaware**

Monitoring Location	Annual Sampling	Semi-Annual Sampling	Semi-Annual Water Levels
RW-10	X		X
MW-28	X		X
MW-29	X		X
MW-31	X		X
BW-1	X	X	X
BW-2			X
BW-3			X
MW-40	X	X	X
P-4	X	X	X
P-5U			X
P-5L			X
P-6	X	X	X
MW-22N	X		X
MW-26N	X	X	X
MW-49N	X		X
MW-54			X
MW-56			X
MW-58			X
MW-18	X		X
PW-1	X	X	X
Surface Water	X		X
Sediments	X		

5/4/2009

Notes:

- (1) - Analytical parameters for groundwater to include volatile organic compounds, semi-volatile organic compounds, dissolved iron and manganese, and field parameters
- (2) - Field Indicator Parameters include temperature, specific conductance, pH, oxidation-reduction potential, and dissolved oxygen.
- (3) - Analytical parameters for surface water to include semi-volatile organics, TAL metals, pesticides and field parameters.
- (4) - Analytical parameters for sediments to include semi-volatile organics, TAL metals and pesticides.
- (5) - A complete round of water levels should be measured synoptically at all wells prior to the collection of samples.
- (6) - In the event that any monitoring point yields insufficient water, the order of sample-collection priority will be VOCs, semi-VOCs, dissolved iron and manganese, and field parameters.
- (7) - For groundwater, "Annual Events" to be conducted in October and "Semi-Annual Events" to be conducted in April.
- (8) - For surface water, "Annual Events" to be conducted in April.
- (9) - Monitoring frequency and the number of locations monitored may be reduced when results demonstrate stable quality.

**Table 2**  
**Plan for Maintenance and Abandonment of**  
**Army Creek Landfill Wells**

Monitoring/Recovery Wells	Recommended Action
MW-1A	Abandon
MW-22N	Maintain for Monitoring
MW-26N	Maintain for Monitoring
MW-27	Decommission and Abandon
MW-28	Decommission but Maintain for Monitoring
MW-29	Decommission but Maintain for Monitoring
MW-31	Decommission but Maintain for Monitoring
MW-38N	Abandon
MW-40	Maintain for Monitoring
MW-41	Abandon
MW-49N	Maintain for Monitoring
MW-54	Maintain for Water-Level Monitoring
MW-56	Maintain for Water-Level Monitoring
MW-57	Abandon
MW-58	Maintain for Water-Level Monitoring
MW-66	Abandon
MW-67	Abandon
MW-68	Abandon
MW-69	Abandon
P-4	Maintain for Monitoring
P-5L	Maintain for Water-Level Monitoring
P-5U	Maintain for Water-Level Monitoring
P-6	Maintain for Monitoring
RW-1	Decommission and Abandon
RW-10	Decommission but Maintain for Monitoring
RW-11R	Decommission and Abandon
RW-12	Decommission and Abandon
RW-13	Decommission and Abandon
RW-15	Decommission and Abandon
B-18	Abandon after SVI Evaluation Completed
BW-1	Maintain for Monitoring
BW-2	Maintain for Water-Level Monitoring
BW-3	Maintain for Water-Level Monitoring
C-1	Abandon after SVI Evaluation Completed
C-2	Abandon after SVI Evaluation Completed
C-3	Abandon after SVI Evaluation Completed
C-4	Abandon
C-5	Abandon
C-6	Abandon after SVI Evaluation Completed by DS&G

4/20/09

## Notes -

- 1) "Monitoring" can include water-level measurements or sampling.
- 2) "Decommission" refers to the removal of pumps, piping and other appurtenances.
- 3) "Abandonment" refers to removal of well, where possible, and grouting of borehole or well in-place.

CHECKED: MR

DRAFTER: CP

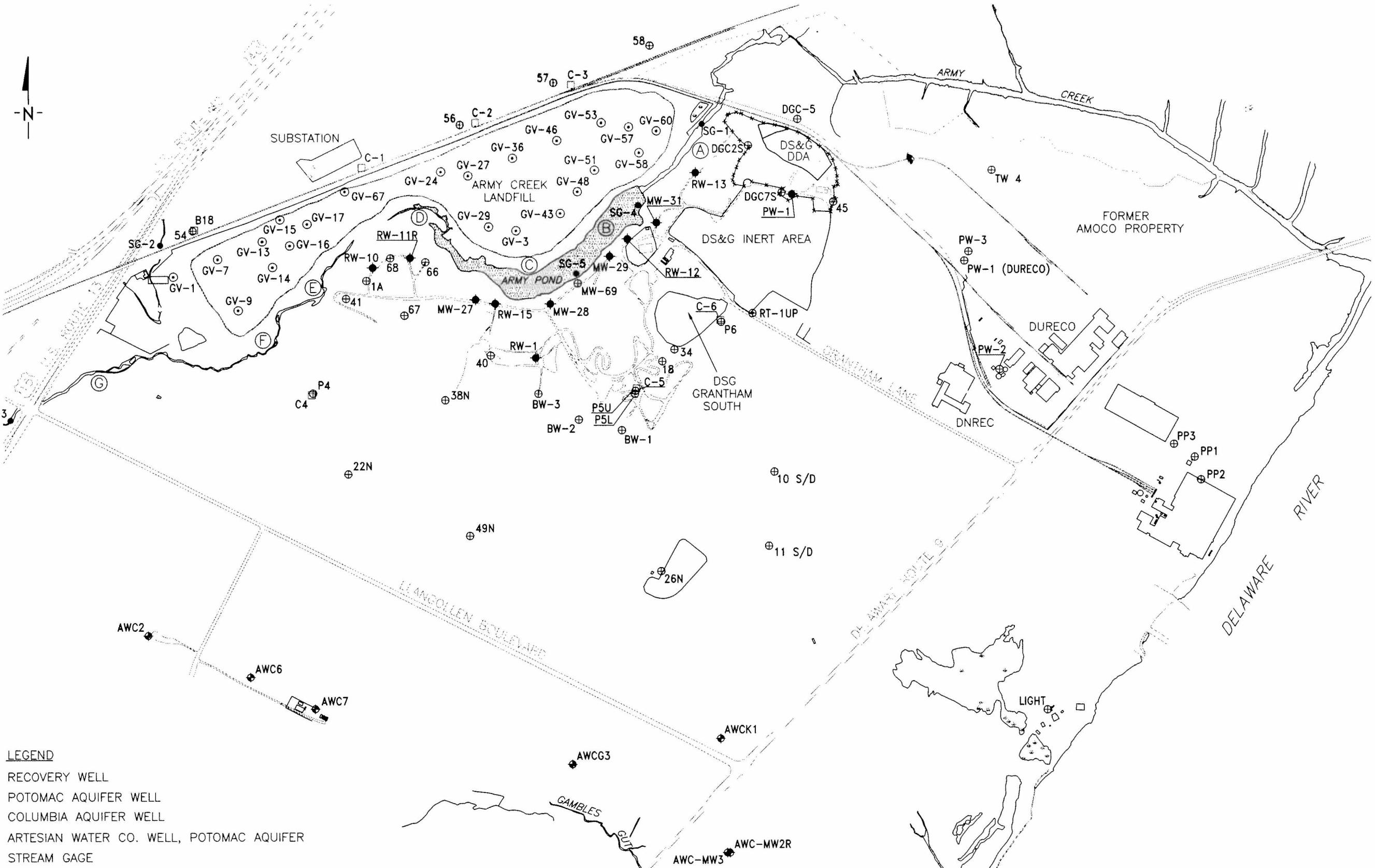
FILE NAME: ACL-002A.DWG

PROJECT NO: ACL

DWG DATE: 7-6-05

LEGEND

- RW-1 • RECOVERY WELL
- 22 ⊕ POTOMAC AQUIFER WELL
- B12 □ COLUMBIA AQUIFER WELL
- AWC2 ♦ ARTESIAN WATER CO. WELL, POTOMAC AQUIFER
- SG-2 • STREAM GAGE
- CONRAIL RAILROAD
- FENCE LINE
- GV-1 ○ GAS VENT
- (G) SURFACE/SEDIMENT SAMPLE SPOT





UNITED STATES ENVIRONMENTAL PROTECTION AGENCY  
REGION III  
1650 Arch Street  
Philadelphia, Pennsylvania 19103-2029

October 28, 2009

Mr. Michael Harris  
Department of Special Services  
New Castle County  
87 Reads Way  
Wilmington DE 19720

RE: Approval of Revised Addendum to 1992 O&M Plan  
Army Creek Landfill Superfund Site

Dear Mr. Harris:

EPA approves Ruth Associates, Inc.'s October 8, 2009 Addendum to the 1992 Operation and Maintenance Plan with the understanding the lead monitoring will also be conducted at well 38N for a finite period of time.

Sincerely,

A handwritten signature in black ink, appearing to read "DR".

Debra Rossi  
Remedial Project Manager  
DE, VA, WV Remedial Branch

cc: John Cargill, DNREC  
Michele Ruth, Ruth Associates

# **APPENDIX B**

## **USEPA-APPROVED ADDENDUM TO O&M PLAN**

# RUTH ASSOCIATES, INC.

October 8, 2009

Ms. Debra Rossi  
Remedial Project Manager  
United States Environmental Protection Agency  
Region III  
1650 Arch Street  
Philadelphia, Pennsylvania 19103-2029

RE: Army Creek Landfill - New Castle County, Delaware  
Revised Addendum to 1992 O&M Plan

Dear Ms. Rossi:

This addendum to the 1992 Operation and Maintenance (O&M) Plan has been prepared to outline the procedures that will be followed for the long-term groundwater and stream monitoring for the Army Creek Landfill, and has been revised to address comments outlined in the September 24, 2009 letter from the United States Environmental Protection Agency. This long-term monitoring program and the submittal of this plan are conditions for the Completion of SOW-2, as outlined in your letter of May 4, 2009. The purpose of this program is to support EPA's assessments of remedy performance and protectiveness as part of the Agency's five-year review process.

## Groundwater and Stream Monitoring Locations and Frequency

Groundwater and stream monitoring will be performed at the locations and frequency provided in the attached Table 1 and Figure 1. Stream monitoring will be conducted annually for a period of five years; surface-water elevations will be monitored semi-annually, synchronously with groundwater elevations. The long-term groundwater monitoring program may be modified based on monitoring results, contingent on approval by the United States Environmental Protection Agency.

## Procedures for Obtaining Water Elevations

Upon arrival at each well and prior to groundwater elevation measurement, the sampling personnel shall verify and record the well identification number on the field form. Prior to opening the well, the sampling personnel shall document any signs of tampering or well deterioration. A depth to groundwater measurement shall be taken using an electronic water level indicator. Personnel shall raise and lower the probe slightly about the water level a few times to determine accurate point of contact. Personnel shall measure and record the static water level read directly off the markings on the tape to the nearest 0.01 foot from the surveyed reference mark, as well as record the time and day of the measurement.

*Addendum to O&M Plan*

*Army Creek Landfill*

*October 8, 2009*

*Page 2 of 6.*

Surface-water elevations will be measured synchronously with groundwater elevations. Staff gauges will be used to measure the surface-water elevation at each of the monitoring locations. The depth to surface water will be measured from the surveyed mark on each staff gauge, and recorded on the field form.

**Sample Collection Procedures**

Surface-water samples are to be collected as grab samples using a decontaminated polyethylene beaker for sample collection. Samples will be poured directly from the sample collection beaker into the laboratory sample bottles, with the exception of TAL metals. The TAL metals sample will be pumped, using a peristaltic pump, from the sample collection beaker through a 0.45-micron filter into the laboratory bottle. New disposable polyethylene and silicon tubing and filter will be used for TAL metal filtering at each sampling location.

Sediment samples will be collected using stainless-steel utensils to collect sediments and place them directly into soil sampling jars for delivery to the lab.

Characteristics of the steam sample location (e.g., sediment and flow characteristics) at the time of sampling will be recorded on the field log form.

Groundwater sampling is to be performed generally in accordance with the USEPA paper "Low-Flow (Minimal Drawdown) Ground-Water Sampling Procedures", and in accordance with this plan.

Wells are to be purged and sampled using either a peristaltic pump or decontaminated submersible pump. Typically wells with a depth to water (DTW) of less than 25 feet below the top of well casing (TOC) and/or well smaller than 2" diameter will be sampled with a peristaltic pump. Wells with a DTW of approximately 25 feet or more below TOC will be sampled with a dedicated submersible pump. In either instance, dedicated or new high-density polyethylene (HDPE) tubing shall be used in each well. If a peristaltic pump is used, a dedicated or new HDPE barb fitting and silicon tubing will also be used.

During well purging the DTW, pump flow rate and field parameter measurements will be collected at intervals of three minutes or more. The pump flow rate will be adjusted in an attempt to limit drawdown. The first field parameter measurements will not be collected until at least one volume of the pump, tubing and flow-through cell have been evacuated. Field parameters include pH, conductivity, dissolved oxygen, temperature and oxygen reduction potential. Purging will be considered complete when three consecutive reading meet all of the following stabilization criteria:

pH	+/- 0.1 SU
Conductivity	+/- 3%
Dissolved Oxygen	+/- 0.3 mg/l

*Addendum to O&M Plan*

*Army Creek Landfill*

*October 8, 2009*

*Page 3 of 6.*

Temperature	+/- 3%
ORP	+/- 10 mV

If it is determined that the stabilization parameters cannot be met, a sample may be collected at the discretion of field personnel and documentation of this deficiency shall be made on the log form.

Once purging stabilization has been achieved, the flow-through cell shall be detached from the pump discharge without affecting the pump flow rate. Pre-preserved sampling containers shall be filled directly from the pump tubing discharge. The pump flow rate should be the same as it was during purging. Field filters are to be used only for the collection of dissolved metals samples.

Once the requisite sample containers are filled, the tops should be securely closed and the samples immediately placed on ice. The samples are to be delivered under chain-of-custody to the laboratory.

Decontamination Procedures

Every effort will be made to use new or dedicated materials during sampling. In the event that this is not possible items will be thoroughly decontaminated between wells. Decontamination procedures shall include the use of an Alconox and de-ionized water mixture followed by a de-ionized water rinse.

Laboratory Analyses, Preparation and Analytical Methods, Preservation and Holding Time Information

All groundwater and surface-water samples will be preserved, prepared and analyzed using the methods identified in Table 2. All groundwater samples are to be analyzed for volatile organic compounds (VOCs) via USEPA Method SW846 8260B, prepared via SW846 5030B. Samples are to be collected in 40 milliliters (mL) VOA bottles preserved with hydrochloric acid (HCl). The sample holding time for VOCs is 14 days from sample collection.

All surface-water and groundwater samples are to be prepared and analyzed for Semivolatile Organic Compounds (SVOCs) via SOW for Organic Analysis, Low Concentration Water, Method SOM01.2. Samples are to be collected in unpreserved 1-liter amber glass bottles. The sample holding time for SVOCs is 7 days from sample collection to extraction and 40 days from extraction to analysis.

All surface-water samples are to be prepared and analyzed for dissolved TAL Metals via ILM05.4 methodology. Samples will be filtered through a 0.45 micron filter prior to

*Addendum to O&M Plan*

*Army Creek Landfill*

*October 8, 2009*

*Page 4 of 6.*

collection in 500-mL plastic bottles preserved with nitric acid. The sample holding time for TAL Metals is six months (28 days for mercury) from sample collection.

All groundwater samples are to be prepared and analyzed for dissolved iron and manganese via ILM05.4 methodology. Samples from selected locations will also be analyzed for lead, utilizing the same methodology. Samples for metals analyses will be filtered through a 0.45 micron filter prior to collection in 500-mL plastic bottles preserved with nitric acid. The sample holding time for dissolved iron, manganese and lead is six months from sample collection.

All surface water samples are to be prepared and analyzed for pesticides via SOM01.2 methodology. Samples are to be collected in unpreserved 1-liter amber glass bottles. The sample holding time for pesticides is 7 days from sample collection to extraction and 40 days from extraction to analysis.

All sediment samples are to be collected and analyzed for SVOCs, TAL metals and pesticides. Samples are to be places into an 8 oz glass jar for delivery to the lab. SVOCs are to be prepared and analyzed via SOM01.2, with a holding time of 14 days from sample collection to extraction and 40 days from extraction to analysis. TAL Metals are to be prepared and analyzed via ILM05.4, with a holding time of 6 months (28 days for mercury) from sample collection. Pesticides are to be prepared and analyzed via SOM01.2, with a holding time of 14 days from sample collection to extraction and 40 days from extraction to analysis.

**Chain-of-Custody and Quality Assurance and Quality Control**

Once collected, all samples are to be kept under strict chain-of-custody (COC) procedures, documenting possession of the samples from collection to receipt by the laboratory. Quality assurance/quality control (QA/QC) samples shall be collected and analyzed in accordance with Table 3, and as described below.

Collect and analyze at least one Field Duplicate sample during each groundwater quality sampling event, collecting and analyzing at least one Field Duplicate for every consecutive group of twenty groundwater samples (or portion thereof). "Field Duplicate" shall mean a groundwater sample collected at the same time from the same monitoring location, following identical procedures but placed in separate container and labeled with a unique ID.

Collect and analyze at least one Matrix Spike/Matrix Spike Duplicate (MS/MSD) sample during each groundwater quality sampling event, collecting and analyze at least one MS/MSD for every consecutive group of twenty groundwater samples or portion thereof. MS/MSD shall mean a groundwater sample collected at the same time from the same groundwater monitoring well location, following identical procedures but placed in

*Addendum to O&M Plan*

*Army Creek Landfill*

*October 8, 2009*

*Page 5 of 6.*

separate container. MS/MSD samples will be spiked and analyzed accordingly by the laboratory.

One Field Duplicate and MS/MSD will also be collected for each set of sediment and surface-water samples.

Collect and analyze at least one Field Blank sample during each groundwater quality sampling event, collecting and analyze at least one Field Blank for every consecutive group of twenty groundwater samples or portion thereof. The Field Blank should be poured (using the appropriate "blank" water: organic-free water for organic parameters and deionized water for inorganic parameters) at a sampling point, not using any of the field equipment, prepared and handled at the site in the same way as any other field sample whereby it must be stored, shipped and analyzed the same way as all other field samples.

Analyze at least one Trip Blank sample during each shipment of samples. A Trip Blank consists of laboratory distilled, de-ionized, analyte-free water in a closed, sealed sample bottle. The Trip Blank accompanies the empty sample bottles to the field, handled along with the field collected samples, and returned to the lab for analysis along with all other samples. One Trip Blank must be prepared by the sample analysis laboratory and analyzed upon return for each day of the sampling event. Trip Blanks evaluate potential sample contamination from VOCs that may be present in the air on-site or in sample shipping containers.

Project Team

Ruth Associates, Inc. (RAI) will coordinate the monitoring program, with primary responsibilities including the measurement of water-levels, the collection and shipment of samples, and reporting of the monitoring results. Test America Pittsburgh will perform the VOC analyses; Compuchem will perform all other laboratory analyses. LAB Validation will review the laboratory reports and report the validated data to RAI the data. RAI will incorporate the validated data to update chemical-quality databases, which will be presented in the report.

Reporting

A report will be prepared to present the methodologies employed and the findings of each semi-annual monitoring event. Groundwater and surface-water elevations will be tabulated, and chemical-quality databases will be updated. A graphical depiction of surface-water levels over time will be presented. Temporal trend analysis of selected contaminants in groundwater and surface water will also be presented. Characteristics of the surface-water/sediment sampling locations will be described, as well as any other noteworthy observations of the groundwater sampling locations.

\* \* \* \* \*

*Addendum to O&M Plan*

*Army Creek Landfill*

*October 8, 2009*

*Page 6 of 6.*

We trust you will find this O&M Plan Addendum adequate to meet your requirements.  
Please do not hesitate to contact us if you have any questions.

Sincerely,

RUTH ASSOCIATES, INC.

A handwritten signature in black ink that reads "Michele C. Ruth". The signature is fluid and cursive, with "Michele" on top, "C." in the middle, and "Ruth" on the bottom right.

Michele C. Ruth, PE  
President

Attachments

cc: Michael Harris, NCC  
Michael Barbara, ACL Remedial Trust  
George Weiner, BR

**Table 1.**  
**Long-Term Monitoring Program**  
**Army Creek Landfill - New Castle, Delaware**

Monitoring Location	Annual Sampling	Semi-Annual Sampling	Lead Analysis	Semi-Annual Water Levels
RW-10	X			X
MW-28	X			X
MW-29	X			X
MW-31	X			X
BW-1	X	X		X
BW-2				X
BW-3				X
MW-40	X	X	X	X
P-4	X	X		X
P-5U				X
P-5L				X
P-6	X	X		X
MW-22N	X		X	X
MW-26N	X	X		X
MW-49N	X		X	X
MW-54				X
MW-56				X
MW-58				X
MW-18	X			X
PW-1	X	X		X
Surface Water	X			X
Sediments	X			

10/3/2009

## Notes:

- (1) - Analytical parameters for groundwater to include volatile organic compounds, semi-volatile organic compounds, dissolved iron and manganese, and field parameters, plus lead for the locations indicated.
- (2) - Field Indicator Parameters include temperature, specific conductance, pH, oxidation-reduction potential, and dissolved oxygen.
- (3) - Analytical parameters for surface water to include semi-volatile organics, TAL metals, pesticides and field parameters.
- (4) - Analytical parameters for sediments to include semi-volatile organics, TAL metals and pesticides.
- (5) - A complete round of water levels should be measured synoptically at all wells prior to the collection of samples.
- (6) - In the event that any monitoring point yields insufficient water, the order of sample-collection priority will be VOCs, semi-VOCs, dissolved iron and manganese, and field parameters.
- (7) - For groundwater, "Annual Events" to be conducted in October and "Semi-Annual Events" to be conducted in April.
- (8) - For surface water, "Annual Events" to be conducted in April.
- (9) - Monitoring frequency and the number of locations monitored may be reduced when results demonstrate stable quality.

Table 2  
Analytical Methods  
Long-Term Monitoring Program  
Army Creek Landfill - New Castle, Delaware

Analyte	Analytical Method	Preparation Method	Sample Holding Time
VOCs (Groundwater)	SW 846 - 8260B	SW 846 - 5030B	14 days from collection
SVOCs (Surface Water and Groundwater)	SOM01.2	SOM01.2	7 days from collection to extraction 40 days from extraction to analysis
TAL Metals (Surface Water)	ILM05.4 <sup>a</sup>	ILM05.4 <sup>a</sup>	6 months from collection (28 days for mercury)
Pesticides (Surface Water)	SOM01.2	SOM01.2	7 days from collection to extraction 40 days from extraction to analysis
Dissolved iron, manganese and lead (Groundwater)	ILM05.4 <sup>a</sup>	ILM05.4 <sup>a</sup>	6 months from collection
SVOCs (Sediments)	SOM01.2	SOM01.2	14 days from collection to extraction 40 days from extraction to analysis
TAL Metals (Sediments)	ILM05.4 <sup>a</sup>	ILM05.4 <sup>a</sup>	6 months from collection (28 days for mercury)
Pesticides (Sediments)	SOM01.2	SOM01.2	14 days from collection to extraction 40 days from extraction to analysis
Temperature, conductivity, pH, ORP and dissolved oxygen	Measured in the field with multi-parameter instrument (Horiba U-22 or similar)		

VOCS - Volatile Organic Compounds

SVOCs - Semivolatile Organic Compounds

<sup>a</sup> - Method ISM01.1 will replace Method ILM05.4 when it is approved by EPA

Table 3  
Quality Assurance and Quality Control Samples  
Long-Term Monitoring Program  
Army Creek Landfill - New Castle, Delaware

QA/QC Sample	Sample Frequency
Field Duplicate	Minimum of one per event. One for every 20 groundwater samples (or portion thereof). One for every 20 surface water samples (or portion thereof). One for every 20 sediment samples (or portion thereof).
Matrix Spike/Matrix Spike Duplicate (MS/MSD)	Minimum of one per event. One for every 20 groundwater samples (or portion thereof). One for every 20 surface water samples (or portion thereof). One for every 20 sediment samples (or portion thereof).
Field Blank	Minimum of one per event. One for every 20 groundwater samples (or portion thereof).
Trip Blank	Minimum of one per event. One for every day VOC samples are shipped.

CHECKED: MR

DRAFTER: CP

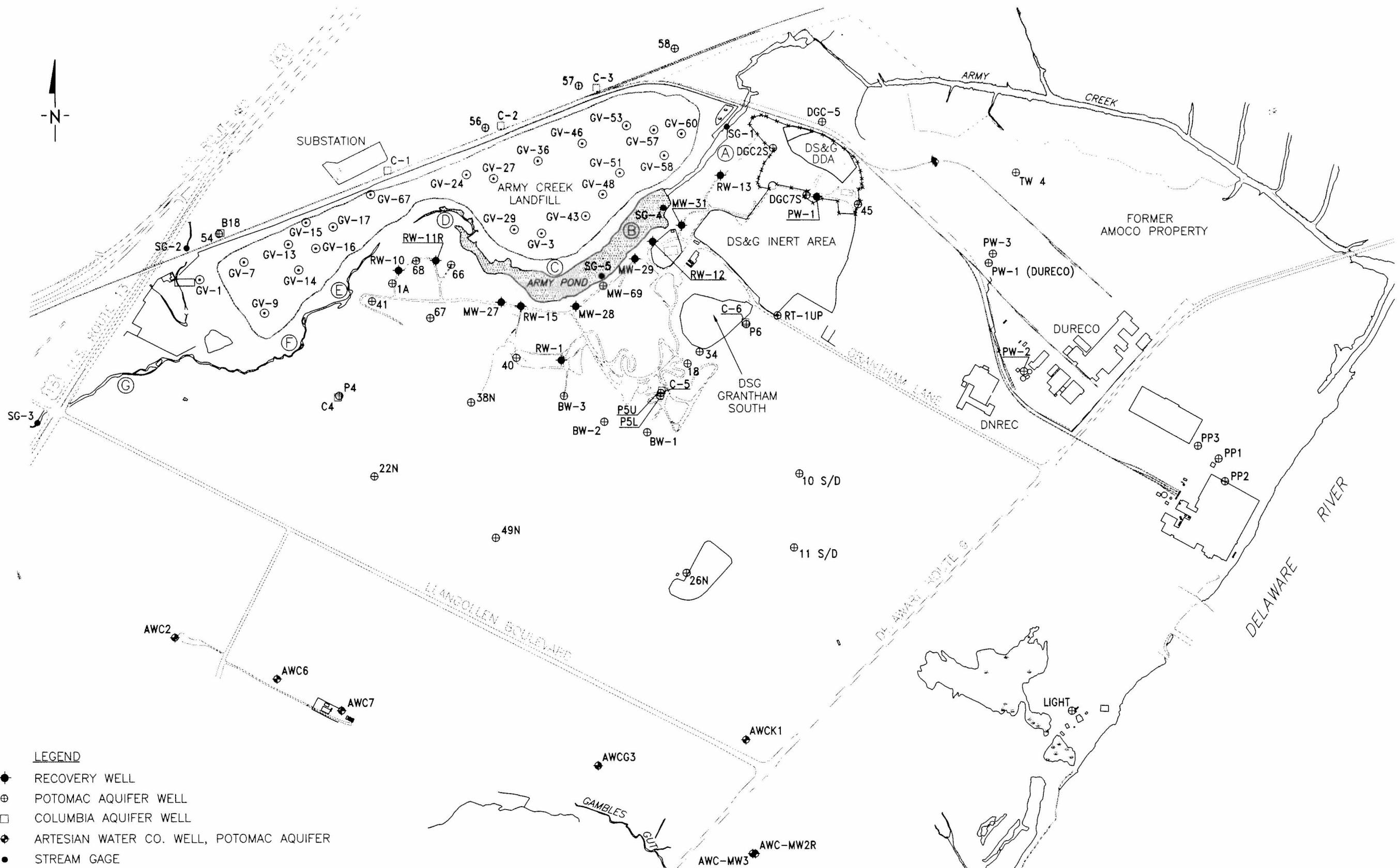
FILE NAME: ACL-002A.DWG

PROJECT NO: ACL

DWG DATE: 7-6-05

- LEGEND**
- RW-1 ● RECOVERY WELL
  - 22 ⊕ POTOMAC AQUIFER WELL
  - B12 □ COLUMBIA AQUIFER WELL
  - AWC2 ♦ ARTESIAN WATER CO. WELL, POTOMAC AQUIFER
  - SG-2 ● STREAM GAGE
  - CONRAIL RAILROAD
  - FENCE LINE
  - GV-1 ○ GAS VENT
  - (G) SURFACE/SEDIMENT SAMPLE SPOT

0 700 1400  
SCALE IN FEET



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### MONITORING LOCATIONS

Vicinity of Army Creek and  
Delaware Sand & Gravel Superfund Sites

FIGURE  
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